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from your president

Since final plans have been completed for the 27th Annual Meeting of the American Society of Dentistry for Children to be held in Dallas in November, it is time to stop and think a little bit about what has happened during the past year.

I feel that one of our greatest accomplishments has been the fine growth in ASDC membership, mainly due to the hard work and interest of William E. Brown, our Vice-President. We should all be pleased to see that our organization has been growing in numbers as the years move along.

Unfortunately, we cannot put our faith in just numbers, but must think and act in terms of good dental service for children. We must be ever mindful that growth in our organization cannot be considered as a great attribute unless each and every member is promoting better dentistry for children. It is much more important to have a few active members in an organization than to have a large conglomeration of lethargic individuals. Each of us in ASDC should remember that we receive from an organization only what we contribute to the work of that group.

Every member of ASDC must become an ASDC leader and not leave the leadership to just the elected officers. Using the words of Buzz Tennet, Past President of Rotary International, we must "try to recoup our forces and start to enact for action and extend for strength" in order to show a healthy membership in ASDC throughout the country.

Every ASDC Unit in the country can best aid our program by having an indoctrination course for each and every new member. At the indoctrination program, new members should be given the basic philosophy of ASDC and the Unit's relationship with the national. He should be provided with a good plan and program for his assistance in the ASDC movement. Once a man has been indoctrinated with the philosophy of ASDC, he cannot help but be a stronger and better member.

So, let's all of us try in the months to come to reorient our thinking along the lines of doing more work and less star-gazing for the betterment of children's dental health throughout the world!

ALBERT ANDERSON

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* Deceased, October 4, 1958.

Diseases of the Oral Soft and Supporting Tissues Of Children*

EDITOR'S NOTE: *We suggest that after you have read this comprehensive, well written report, you present it to your pediatrician associates.*

A.E.S.

THIS review of the literature by a study-group** of the American Academy of Pedodontics was organized to develop a simple and useful reference on the diagnosis and treatment of the diseases of children's soft and supporting oral tissues. The original charge to the study-group appears appropriate to repeat: "Since many conflicting statements have been reported about the occurrence of periodontal disease during childhood, about the confusion in the diagnosis of Vincent's disease and acute herpetic gingivostomatitis, about the communicability of these two conditions, about the treatment of gingivitis during childhood, and about the relationship of the periodontal condition of childhood to that of adulthood, it appeared that one group should be assembling and appraising the literature in this area of dental interest and writing conclusions for the scientific guidance of members of the Academy."

Five specific tasks then were assigned:

I. Prepare a summary of (1) the etiology, (2) the communicability, (3) the symptoms, (4) the differential diagnosis, and (5) the attack rate during the periods of the *primary, mixed* and young *permanent* dentitions for:
   1. Vincent's disease
   2. Acute herpetic gingivostomatitis.

II. Appraise the treatment of acute herpetic gingivostomatitis by such drugs as:
   1. Aureomycin
   2. Gentian violet
   3. Hydrogen peroxide
   4. Penicillin
   5. Phenol
   6. Potassium chlorate
   7. Silver nitrate
   8. Smallpox vaccine
   9. Sulfonamides
   10. Sulfarsphenamine
   11. Vitamin B
   12. Others.

III. Compare the time required for recovery from acute herpetic gingivostomatitis under supportive treatment alone, under medication, and with the lack of any treatment. If supportive treatment is helpful, what should it be?

IV. Cite the evidence which shows that Vincent's disease and acute herpetic gingivostomatitis are, or are not, public health problems.

V. Achieve conclusions regarding the continuance in adulthood of the periodontal conditions in childhood.

I. VINCENT'S DISEASE AND HERPETIC GINGIVOSTOMATITIS; A SUMMARY

Epidemics of Vincent's infection have been reported in schools, and pediatricians still report cases occasionally, but

* Presented before the 10th Annual Meeting of the American Academy of Pedodontics, October 30-31 and November 1, 1957, at Miami Beach, Florida.

** Mervin L. Binstock, Roy L. Lindahl, Melvin A. Noonan, Paul F. Sydow, Helen T. Williams, William E. Cody, Chairman.

close study by a dentist usually reveals that the diagnosis was improperly achieved and that the condition should have been recorded as herpetic gingivostomatitis. Positive smears for the fusospirochetal flora now are known to be misleading and no longer should be used as a definitive diagnostic factor. A positive smear can be obtained from many mouths which are thoroughly healthy.

It now becomes the task of this Committee to shed light on a number of factors associated with these two diseases so that a more thorough understanding of diagnosis and treatment may be had.

A. *Etiology*

1. *Terminology*

Vincent's Infection

(1) Orban and Wentz[10] prefer to call the condition "acute ulcerative stomatitis."

(2) The atlas of the U.S. Naval Dental School states that "the choice of name is necrotizing gingivitis."

Herpetic Gingivostomatitis

(1) Herpetic gingivostomatitis is but one name for this viral infection.

(2) Other terms are "herpetic stomatitis," "apthous stomatitis," "ulcerative stomatitis," "primary herpetic gingivostomatitis," "recurrent herpetic stomatitis," and "recurrent habitual aphthae."

2. *Microorganisms and Susceptibility of Tissues*

Vincent's Infection

Vincent's infection for many years was thought to be a fusospirochetal infection. Information from quite recent research has raised a number of questions about the role which the fusospirochetal flora plays in this disease. The necrotic tissue is the primary lesion.[1]

The predisposing factor for this disease is the lowered resistance of the tissues concerned. Damaged tissue allows or even encourages the penetration and proliferation of ordinarily harmless organisms. The damaged tissue can be produced by both local and general factors. The local factors may include oral sepsis, improper restorations, partially erupted teeth and chronic irritations caused from excessive smoking or other habits. The general factors may include any disease or condition which decreases the resistance of the oral tissues, such as debilitating diseases, blood diseases (especially leukemia), dietary deficiencies (especially the lack of vitamins C and B), and nephritis with its associated uremia and intoxication.

Herpetic Gingivostomatitis

The virus of herpes simplex is shown conclusively by Dodd and her co-workers,[6] as the cause of herpetic gingivostomatitis. This group of investigators made swabbings from the lesions in the mouths of patients and inoculated immediately the scarified corneas of rabbits in order to test for the presence of the virus. Within 24 to 48 hours, typical herpetic vesicles developed and, hence, demonstrated the viral origin of the condition.

Scott, Steigman and Convey[7] produced evidence from their study that closely verified the etiologic mechanism demonstrated by Dodd and her group.

Another development which substantiates the conclusion that the virus simplex has etiologic significance is the formation of herpetic neutralizing antibodies in the patient's blood during his period of convalescence.[8]

The patient's history of the onset of herpetic gingivostomatitis usually elicits a statement regarding a preceding attack of an upper respiratory infection. Sometimes the history elicits the recital of a preceding gastrointestinal disturbance or an attack of infectious mononucleosis.

3. *Communicability*

Vincent's Infection

The simple one word answer to the question, "Is Vincent's infection contagious?" appears to be "No." All attempts to transmit this infection have failed. It cannot be transferred by contact with mucous membranes, no matter how large the amount of exudate or how highly active the exudate may be.

Subcutaneous or parenteral inoculations of the exudate in guinea pigs *can* produce a fusospirochetal infection.

"On the contrary, Vincent's infection seems to be one of a group of endogenous infections which, like subacute bacterial endocarditis or peritonitis produced by intestinal perforation, are induced by ordinary harmless surface-parasites under particular conditions. These diseases as a group are not communicable."[2]

Herpetic Gingivostomatitis

"The disease occurred in children of all ages from a few weeks to 14 years of age, but was far more common in children between the ages of one and three years. It showed no seasonal variation and no difference for sex or race."[6]

Scott and co-workers[7] report similar figures, but also report one illness of a 24-year-old female.

Evidence indicates that the disease is a highly communicable one. Fifty per cent of the patients reported by Scott and co-workers[7] presented a history of contact. Familial epidemics provide further evidence of this communicability.

Patients with the acute primary type should be isolated and treated as patients with other communicable diseases. This disease should not be regarded lightly; the department of pediatrics at the University of Michigan has knowledge of a number of deaths from it.

B. *Symptoms*

Vincent's Infection

Vincent's infection may occur in the oral cavity in (1) an acute or in (2) a chronic form.

The intensity of the acute form may vary from irritation of a few gingival papillae to the involvement, on occasion, of the inner surfaces of the cheeks, the tonsils, and the tongue. In this acute form, the tissues associated are ulcerated and painful. This form is accompanied by fetor, bad taste to the patient and malaise.[8]

Fever and lymphadenopathy are reported quite consistently as symptoms, but these reactions also may be caused by secondary infections.[23]

Any oral inflammation serves as a contraindication for securing body temperature orally; a rectal reading will be found to be much more accurate. During the acute stage, Vincent's infection easily is recognized because it is so unlike any other gingival disease. The lesions develop a yellow-green or gray exudate which, upon removal, leaves a bleeding surface.

The chronic types of Vincent's infection often are mistaken for marginal gingivitis since they are far more difficult to diagnose than the acute

Herpetic Gingivostomatitis

Herpetic stomatitis can be divided into separate classifications: (1) the primary herpetic gingivostomatitis and (2) the recurrent herpetic stomatitis.

The initial infection of the herpetic virus produces an acute systemic reaction. The clinical appearance is characterized by fever, irritability, a sore mouth, red swollen gums, oral fetor, and regional lymphadenopathy. Ulcers may not appear in all mouths, but the severe inflammatory reaction of the mucosa always is present. When ulcers occur they start as vesicles which rupture rapidly to form shallow ulcers with ragged and undermined borders. Initially the ulcer is covered with a grayish pseudomembrane and the inflammatory reaction at its border is considerable. The most frequent sites for these ulcers are the gingiva, buccal mucosa, tongue, and lips, but they may involve the larynx, trachea, esophagus, and nasal mucosa.

The recurrent herpetic stomatitis is seen in previously infected older patients without generalized symptoms. In spite of specific antibodies developed, the recurrent form is possible be-

type. Tenderness of the gingivae to touch and a "cupped-out" appearance of the interdental papillae may be the only symptoms left to suggest a diagnosis of Vincent's infection.

cause the virus invades cells and becomes protected. Large ulcers develop.

"Acute herpetic infections may also occur at the transitional border in the mouth as aphthae or on the lips as herpes labialis simplex."[13] The ulcers are painful. They develop a membranous base and the characteristic inflammatory halo is present, but produces no scarring.

C. *Differential Diagnosis*

Vincent's Infection

Inasmuch as fusospirochetal organisms occur widely in human mouths and the transfer of these organisms in human subjects has failed to produce a Vincent's infection the value of a smear for diagnosis of this disease has been reasonably well ruled out. A positive smear would appear to have no value as a diagnostic criterion unless confirmed by the clinical findings.

In instances of acute Vincent's disease, the onset is sudden, the tissues exhibit a marked tenderness and the patient suffers almost constant pain. The gingival tissues bleed very easily and there is a very foul fetid odor. Because the tissues are painful, oral hygiene for the patient is performed poorly or not at all. The lesions start in the interdental space and the necrotic tissue remaining in place is gray and easily removed, leaving a bleeding surface which is cup or saucerlike in shape.

In subacuate cases of Vincent's infection the systemic symptoms are absent. The onset no longer is sudden and the tenderness is not nearly as severe. Localized areas of destruction still will be found and these areas will bleed freely.

Herpetic Gingivostomatitis

Herpetic stomatitis may be confused with Vincent's infection, lesions of exanthematous diseases, and chemical stomatitis.

One of the most important discriminatory factors in the differential diagnosis of Vincent's infection and primary herpetic gingivostomatitis is the lack of destruction of the interdental tissue that occurs in Vincent's disease. The elevation of temperature, as a rule, does not precede the Vincent's infection, as it does the acute herpetic gingivostomatitis. Both exhibit fever, soreness, bleeding, and lymph adenopathy.[8]

The lesions of the exanthematous diseases do not exhibit the characteristic inflammatory halo and are localized with the associated gingival changes characteristic of herpetic gingivostomatitis.

Chemical stomatitis, which can be produced by aspirin and some forms of toothache drops, does not have the characteristic inflammatory halo of herpes.

The recurrent form is not a systemic manifestation and it develops only in localized areas such as the lips or buccal mucosa. It, too, starts as a vesicle or group of coalescing vesicles.[8]

D. *Prevalence in Children*

As previously stated, many instances of Vincent's infection have been reported in children, either as an epidemic in a school or in a single patient. Upon closer and more complete examination the diagnosis has to be changed to herpetic gingivostomatitis. Kerr[9] states that he never has seen an instance of Vincent's infection in a child under 12 years of age. Schour and Massler[14] report, "Vincent's infection . . . is rare in the young."

The highest prevalence of primary herpetic gingivostomatitis occurs in young children between the ages of one and three. Occasionally it is reported in children under one year of age. Scott, Steigman and Convey[7] give the age-range as from one to 14 years, with one instance reported in a female 24 years of age. Neither sex nor race appear to exhibit a significant susceptibility.

II. Acute Herpetic Gingivostomatitis; an Appraisal of Treatment

An analysis of the treatment of acute herpetic gingivostomatitis is difficult to accomplish by a perusal of the available literature. There are almost as many ap-

proaches to treatment as there are writers and many of the articles published submit little or no scientific evidence to support the conclusions which are made. Another problem which makes the evaluation of the literature confusing is the terminology which is used. This problem appears to be growing less in the recent literature, and perhaps it will permit a more accurate evaluation in the future.

Acute herpetic gingivostomatitis, be reminded, is a primary infection produced by the virus of herpes simplex,[11] and several writers, because of the self-limiting nature of the condition, suggest symptomatic and supportive treatment.[1,2,3,4] Kerr[2] states that primary herpetic gingivostomatitis does not respond to therapeutic measures of an abortive or curative nature. Other writers[4,5] concur with this conclusion. The approach to the treatment of this disease, then, should be of a symptomatic and supportive nature. The treatment recommended in the literature[1,2,3,4] may be outlined as follows:

1. Relief of subjective symptoms.
   a. Relieve pain
   b. Reduce temperature
2. Prevent secondary infection.
3. Prevent dehydration.

Hence, it appears reasonable to group the drugs used for treatment according to the action desired.

A. *Drugs Used to Relieve Symptoms*

Kerr[1] recommends a warm alkaline lavage with a solution made by adding one teaspoonful of baking soda and one-half teaspoonful of sodium chloride to one quart of water. This solution is heated to an acceptable temperature, and one quart of the solution is used each hour for several hours to irrigate the mouth until the patient is reasonably comfortable. The interval between irrigations is then extended to four hours. The heat relieves the symptoms and the lavage keeps the mouth free of debris. Kerr reports no scientific study to support this recommendation.

Scott, Steigman, and Convey[4] studied 33 patients who were suffering from acute herpetic gingivostomatitis and obtained satisfactory relief of symptoms with a one per cent aqueous solution of methyl rosaniline (gentian violet). The duration of visible signs varied between six and 16 days and averaged 11 days. The ulcerations usually healed five to six days after their appearance. Symptomatic improvement was noted before the local lesions disappeared. No statement was made concerning the effect of the gentian violet on the duration of the disease, but it was noted that the disease was self-limiting and any method of treatment would have to be evaluated with this situation in mind.

To reduce the elevated temperature which exists with this disease Kerr[1,2] recommends antipyretic drugs. None of the other writers whose articles were reviewed mentioned prescribing any drug or treatment for the febrile condition of the patient.

B. *Drugs Used to Prevent Secondary Infection*

Nonirritating bacteriocidal drugs such as nitromersol (metaphen, Abbott), two per cent acriflavin and mercocresols have been recommended[1,2] when applied topically to prevent secondary infection.

Aureomycin, according to Kerr,[1,2] when given in adequate doses, may alter the course of the disease but acts mainly to prevent secondary infection. He

states also that penicillin may be used for the purpose of preventing a complicating infection.

Massler[12] states that, if penicillin is used to prevent secondary infection, there is a danger of fixing the virus in the cells so that the ulcerations fail to heal.

Zegarelli, et al.,[5] studied 14 patients who had primary herpetic stomatitis. Seven of these patients were used as controls, and the remaining seven were treated with chloramphenicol (chloromycetin). The response to the chloramphenicol was not dramatic and the benefits were suggestive of decreased secondary infection. The duration and course of the disease for the two groups was practically the same. The control-group received only palliative treatment, the type of which was not described.

C. *Prevention of Dehydration*

Acute herpetic gingivostomatitis, because of its painful nature, may cause the patient to refuse liquids and foods. This loss of appetite is particularly noticeable in the young child. The lack of proper amounts of food and liquid may lead to dehydration which becomes a major problem.[2]

Kerr[1, 2] recommended that fluids be forced to prevent dehydration although he did not mention any specific fluids. He stated, in extremely young patients, that dehydration presented a major problem and was treated best by hospitalization and, if the patient became severely dehydrated, consideration be extended to parenteral fluids.

F. *Further Considerations in Treatment*

None of the papers reviewed recommended the use of caustic drugs, such as phenol or silver nitrate, for the treatment of acute herpetic gingivostomatitis.

Smallpox vaccine has been recommended to prevent recurrent lesions[6] on the theory that a cross-immunity may exist between the viruses of herpes and vaccinia, and that the presence of the virus of vaccinia in the cells will prevent the entrance of the virus of herpes. It has been shown, however,[7] that animals with a strong immunity to one virus are susceptible to infection by the other, and that the two viruses may infect the same cell simultaneously.[8, 9]

Treatment with vitamin B (complex) has been suggested[11] to prevent recurrent lesions with the notion that the virus was neutrotrophic, and it was thought that the presence of vitamin B would prevent activation.

The treatments recommended which utilize caustic drugs, vaccine for smallpox and therapy with vitamin B all appear to be suggested for recurrent herpetic lesions and not for acute herpetic gingivostomatitis.

During the review of the literature nobody was found who recommended the use of potassium chlorate, the sulfonamides or sulfarsphenamine. The use of the sulfonamides or sulfarsphenamine could be rationalized as a step of treatment designed to aid the prevention of secondary infection.

Insofar as treatment is concerned, it appears that little can be done to shorten the course of the disease. Any treatment employed can be expected to make the patient more comfortable only, prevent secondary infection, and prevent dehydration.

III. Gingival Disease; a Public-Health Problem?

Inasmuch as epidemics of Vincent's infection have been reported in schools and epidemics of herpetic stomatitis in

the nurseries of hospitals, the question has been raised "Should Vincent's infection and herpetic gingivostomatitis be reported to health officers and treated as communicable diseases?" Five references may be cited which provide information.[1, 2, 3, 4, 5]

If a public-health problem is interpreted as one extending beyond a single individual to include many individuals, then Vincent's infection should not be regarded as a public-health problem. In this regard, Pelton and Wisan's book[5] states: "Females are as susceptible to Vincent's infection as males and the disease affects civilians as well as military personnel. In troops, at least, the disease has occurred in outbreaks which resemble epidemics; isolation of the patient and sterilization of his personal effects formerly were common military practice on the premise that the disease was contagious. A research commission of the American Dental Association reported in 1945 that there seems to be no clear or convincing direct or other evidence that the disease is, in fact, communicable." With the same interpretation of the term, public-health problem, acute herpetic gingivostomatitis *is* a definite public-health problem. Pelton and Wisan's book continues, "Unlike Vincent's infection, primary herpetic gingivostomatitis is uncommon in adult life. It usually occurs in young children, and occasionally in infants under the age of one year. It may affect children in the late teens, boys and girls being equally susceptible. The disease is highly communicable and may occur at any season of the year."

The evidence appears to support the conclusion that Vincent's infection is not a public-health problem, while acute herpetic gingivostomatitis is a public-health problem of some concern.

IV. Relationship of Child's Periodontal Condition to That of Adulthood

There is no direct relationship between the continuance in adulthood of a periodontal condition and its presence in a child with a primary dentition.[1] However, the young adolescent with a periodontal condition, such as acute necrotic gingivitis, may suffer damage to the supporting bone which will follow to adulthood and perhaps even become more progressive.[2] Another important condition that will cause a periodontal condition to carry over to adult life is a traumatic occlusion that has been corrected during adolescence.[3]

V. Observation and Education by the Pedodontist

The education of the patient and family in preventive practices is a major consideration for maintaining or safeguarding the health of a young person's supporting tissues. The pedodontist should stress continually the dietary regimen and the importance of care at home. Calculus, oral habits, such as mouth breathing, inadequate interproximal contacts, the irritating effects of poor restorations, the effect of missing teeth, the malposition of teeth, and occlusal trauma, it is agreed, represent some of the local etiologic factors of periodontal disease. Their correction and the reinstitution of normal physiologic appearance and function of the periodontium become objectives of the pedodontist.

The pedodontist, at the time of recalling his patient, can examine the gingiva clinically and the supporting structures radiographically. These serial examinations furnish the basis for recommendations to emphasize the care of the oral cavity at home.

A. Normal gingiva examined clinically reveal the following characteristics:

1. Color—pink;

2. Texture—stippled;

3. Architecture—knifelike gingival margins and well-formed papillae;

4. Consistency—firm;

5. Gingival sulcus—of shallow depth and free of exudates.

B. Healthy supporting structures examined radiographically show:

1. Well-defined alveolar bone (lamina dura) continuous over the alveolar crest. The shape and contour of the interseptal crests require some further study and investigation in order for deviations to serve fully as diagnostic guides.

2. Alveolar process forming a net-like structure of bony trabeculae enclosing marrow spaces. It has been noted by Gilson[4] that heavy trabeculae more frequently are associated with periodontal breakdown than are fine trabeculae.

3. An even, thin, dark line representing the periodontal fibers.

4. Dense cortical layer of alveolar process.

5. Cementum of varying thickness.

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Stannous Fluoride vs. Sodium Fluoride—A Progress Report

CHARLES W. GISH, D.D.S.,* CHARLES L. HOWELL. D.D.S.* AND JOSEPH C. MUHLER, D.D.S.**

EDITOR'S NOTE: *If, after reading this article, you would like more information about the technic of application of stannous fluoride, and a supply of the material, you may write to Dr. Muhler, who will be pleased to help you.*

A.E.S.

IN previous publications[1,2] the clinical procedure followed throughout this study, and the results at the end of one year and two years were presented. The significant advantage of a single topical application of stannous fluoride over the conventional four treatments of sodium fluoride was demonstrated by the data obtained at the end of each of the two years' study. This paper presents the clinical dental caries data at the end of three years; namely, the results for Group I which began three years ago and which has now received a single application of an 8 per cent solution of stannous fluoride once a year, and Group II which started two years ago and has received an application of an 8 per cent solution of stannous fluoride each year, and Group III which started one year ago and has received one application of an 8 per cent solution of stannous fluoride. All groups are compared to their appropriate controls treated simultaneously with a series of four applications of sodium fluoride once each three years.

EXPERIMENTAL

The method of dividing the children into their respective treatment groups, the technique of application and the clinical procedure have been previously described.[1] This study is designed to run for at least a 5-year period, with new second grade children added each year. Each group of new second grade children as well as those children already participating in the study program, will receive either a single application of stannous fluoride once a year, or four applications of sodium fluoride once every three years. The same dentist (C. W. G.) is performing all of the clinical examinations.

DATA AND DISCUSSION

The results of this study are shown in Table I and indicate the findings for children in Group I who have now received three single stannous fluoride applications one year apart and those children who have received one series of four applications of sodium fluoride. Group II children have been similarly treated, but were started two years ago. Group III children were started one year ago. In Group I, the dental caries increments in terms of DMFS and DMFT indices indicate a significant superiority of a single application of stannous fluoride at the end of one year as shown in Table I. At the end of two

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TABLE I

A COMPARISON OF THE EFFECTIVENESS AT END OF 3 YEARS OF A SINGLE APPLICATION PER YEAR OF AN 8 PER CENT SOLUTION OF STANNOUS FLUORIDE TO A SERIES OF FOUR APPLICATIONS OF SODIUM FLUORIDE ONCE EVERY THREE YEARS.

Group	Time of Examination	Agent	No. of Subjects	DMF Teeth INCREMENT	DMF Teeth % REDUCTION	DMF Surfaces INCREMENT	DMF Surfaces % REDUCTION
I	1 year	NaF	242	0.76	21 (p=.08)*	1.25	26 (p=.025)
		SnF_2	247	0.60		0.93	
	2 year	NaF	222	1.08	32 (p=.004)	1.94	21 (p=.04)
		SnF_2	226	0.73		1.53	
	3 year	NaF	220	1.48	35 (p=.001)	2.68	35 (p=.002)
		SnF_2	196	0.96		1.73	
II	1 year	NaF	237	0.58	59 (p=.0007)	1.19	56 (p=.0002)
		SnF_2	230	0.24		0.52	
	2 year	NaF	235	0.98	46 (p=.001)	1.88	57 (p=.0001)
		SnF_2	222	0.53		0.81	
III	1 year	NaF	226	0.84	31 (p=.001)	1.33	35 (p=.001)
		SnF_2	224	0.58		0.86	

* Calculated on the basis of the T test.

years this same group has maintained its significant superiority for the children receiving the stannous fluoride. After three years, there is a 35 per cent superiority for the children receiving the stannous fluoride as compared to those receiving the sodium fluoride when the DMFT index is used, and a 35 per cent superiority when the DMFS index is used. All of these reductions are significant as indicated in Table I. It is of interest to note that not only has the single application technique using stannous fluoride maintained its significant superiority over sodium fluoride during a three year study program, but its effectiveness seems to increase when the three year data are compared with those obtained at the end of one year. This is of real significance, since one of the major objectives of a successful topical treatment program is one which maintains the anticariogenic effectiveness over an extended period of time.

The DMFT and DMFS indices for Group II at the end of one year also indicate a significant superiority of a single application of stannous fluoride. At the end of two years this same group has maintained a highly significant superiority for the children receiving the stannous fluoride. After two years, there is a 46 and 57 per cent superiority for stannous fluoride in terms of DMFT and DMFS indices respectively.

Group III at the end of one year shows a 31 and 35 per cent superiority for one application of stannous fluoride over a series of four applications of sodium fluoride in terms of DMFT and DMFS indices, respectively.

The results of this clinical study indicate a continuation after a three year period of the significant superiority of a single application per year of stannous fluoride over four applications of sodium fluoride at three year intervals. If this reduction in caries continues for even longer periods, the numerical de-

crease in caries prevalence will be highly significant in terms of the total teeth saved from caries.

Summary

At the end of three years a single application of a freshly prepared 8 per cent solution of stannous fluoride applied once each year has been shown to be significantly more effective in reducing dental caries in children than a series of four applications of a 2 per cent sodium fluoride solution applied at the beginning of the three year study period. These clinical results again indicate a marked advancement in topical fluoride treatment for use in preventive dentistry due to a saving in clinical time, cost, convenience to patient and parent, as well as an increase in clinical effectiveness.

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Quadrant Dentistry for Children

THEODORE R. FERGUSON, B.S., D.D.S.*
HARBANS L. BHATIA, B.D.S., M.S.**

DOING children's dentistry in quadrants is more expedient, more efficient and economical than restoring one tooth at each sitting. To do multi-restoration dentistry for the child patient two things are essential—cooperation and a clean, visual area of operation. How these can be had so that the operator may do quadrant dentistry in the shortest amount of time, is the theme of this paper.

Cooperation can be obtained best by rendering the dental operation painless to the child patient, and there are a number of ways to do this. I have found local anesthesia, correctly administered, most effective from the standpoint of controlling pain and most efficient from the time aspect. This is particularly true when a rubber dam clamp must be affixed to a tooth to isolate the area of operation with a rubber dam. Since the technique employs the rubber dam, local anesthesia is obvious. Some may prefer hypnosis or other suggestion media to get cooperation. Local anesthesia, however, works quickly, renders the dental operation painless, and at the same time gives the operator a patient who is alert and rapidly responsive to his instructions.

LOCAL ANESTHESIA

Three things must be borne in mind when one considers local anesthesia for the child patient. First, it is unwise to prepare the syringe and needle in the sight of the child. Second, a needle having a fine lumen, 27 gauge or smaller, should be used; a fine needle enters the tissue painlessly. Third, the anesthesia must be profound enough and of sufficient duration to permit completion of all operative procedures in the entire quadrant.

If the field of operation contains a quadrant in the mandible, the mandibular nerve supplying this area is blocked. In addition to the mandibular block, infiltration anesthesia is given to the buccal mucosa of the teeth carrying the rubber dam clamp. The infiltration anesthesia makes it possible to affix the rubber dam clamp without the usual discomfort of clamp impingment on the soft tissues.

Infiltration anesthesia is used for the teeth in the maxillary arch. Here, too, as in the mandible, anesthesia is given with the thought of preparing the teeth for restoring an entire quadrant. Anesthesia is injected buccally and lingually.

When profound anesthesia is attained, preparation for the application of the rubber dam is made.

RUBBER DAM SUPPLIES

1. Rubber dam, dark, heavy, 5 x 5 inches
2. Young's rubber dam frame
3. Rubber dam punch
4. Rubber dam forceps
5. Rubber dam clamps—8A, 26, 25, 24, 3A, 4A, 5A, S.S.W.

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6. Ligature-Dentotape J & J
7. Wedges—wooden, round, pre-cut
8. Hemostat
9. Plastic instrument (Hollenbeck carver No. 3 preferred)
10. Lubricant.

Clinical Procedure

Selection and placement of the rubber dam and the forming of a continuous matrix about the tooth (or teeth) will be described in ten consecutive steps.

1. *Selection of Rubber Dam.* The heavy, dark rubber dam has been found to serve our purpose most effectively because it is tougher and less likely to tear. This added toughness isolates the tooth more efficiently from its soft tissues. Another point in its favor is that there is less glare to dark than light rubber dam.

2. *Marking the Rubber Dam.* Various methods have been used to mark a rubber dam. None, however, have been found to be more efficient, accurate, and expedient than the rubber dam stamp. The stamp (A) and a stamped rubber dam (B) are shown in Fig. 1.

Holes are punched in the rubber dam to include all teeth in one quadrant. The most distal tooth, generally the first permanent molar tooth, carries the rubber dam clamp. The anterior tooth in the quadrant is the incisor tooth. This manner of rubber dam preparation enchances vision and makes multiple cavity preparations and restorations possible in one sitting.

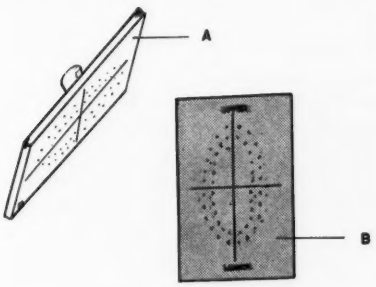

FIG.1. A. RUBBER DAM STAMP.
B. RUBBER DAM AFTER STAMPING.

3. *Selection of Rubber Dam Clamp.* Two types of rubber dam clamps are available for the molar anchor teeth—the wing and wingless. Either one may be used. I prefer the wingless type, because it is much easier to place the rubber dam over it, and also because it has less tendency to tear the rubber dam.

4. *Rubber Dam Lubricant.* The rubber dam is lubricated when the correct rubber dam clamp has been selected; this facilitates placement of the dam. Numerous lubricants are available for the lubrication of a rubber dam, but most popular are vaseline, cocoa-butter, and shaving cream. Shaving cream, used sparingly, is better than the other two because it dries in a relatively short time. When it does dry, it holds the rubber dam more securely around the gingivae.

5. *Placing Rubber Dam Over the Clamp.* After the rubber dam has been lubricated, the clamp of choice is placed on the molar tooth. If the clamp is of the wingless variety, the most distal hole on the punched rubber dam is stretched between the middle fingers. The stretched dam is then carried over the clamp bow; when it is over the bow, the dam is released to hug the cervical area of this tooth.

The procedure is somewhat different for the operator who prefers to use the winged clamp. Now the stretched rubber dam is placed first under one clamp projection, then over the clamp bow, final-

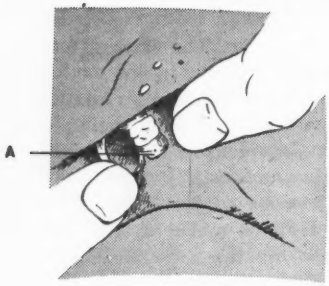

FIG.2. RUBBER DAM CLAMP IS FIRST PLACED ON THE TOOTH, THEN THE DAM IS APPLIED OVER THE CLAMP.

ly under the other clamp projection (Fig. 2).

6. *Rubber Dam Frame.* After the rubber dam is attached to the last molar tooth, a rubber dam frame (Young's) is attached to the dam (Fig. 3). This is done to secure the rubber dam and to facilitate engagement of the remaining teeth within its punched quadrant. The Young's rubber dam frame is used because it does not confine the child's face as would the conventional type of rubber dam holder.

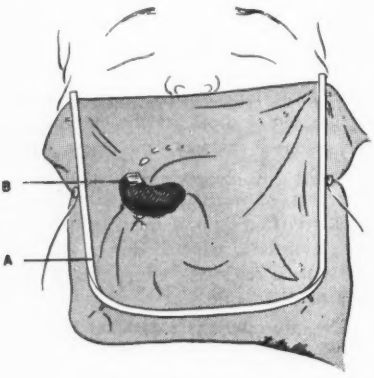

FIG.3. A. YOUNG'S FRAME IN PLACE.
B. UPPER MOLAR ANCHORAGE.

7. *Placing Rubber Dam on Remaining Teeth.* Teeth anterior to the clamped tooth are usually easily engaged by stretching the dam at each interproximal space. Stretching permits the lubricated dam to slip between the contacts of these teeth into the respective interproximal spaces. In rare instances, where this cannot be done, a No. 3 Hollenbeck carver is used to gain separation for rubber dam passage through the contact points. The cuspid tooth anterior to the clamped molar is usually ligated, and the free ends of the ligature are left one inch long. To this ligature extension is attached a rubber dam weight to hold the lower lip down; thus the lip does not dislodge the dam. This is done only if the field of operation is on the mandibular teeth.

Where spacing occurs between the anterior teeth, rubber dam fixation is facilitated by tacking denture compound between these teeth.

8. *Final Preparation of Patient.* The chair is adjusted for the operator's and patient's convenience; rubber dam is trimmed to free nasal air passages; and the child is instructed to swallow. If the latter can be done, the hazard of the saliva ejector pinching the lip can be eliminated. If the child cannot swallow because his saliva is too ropey, he should be taught to maneuver the saliva ejector out of the operator's range.

9. *Wedge.* A wooden wedge is placed cervically between the teeth to be worked on. This reduces the hazard of catching and tearing the rubber dam. To place the wedge, one end of it is grasped in a hemostat, and the other end is coated with a lubricant. It is then inserted from the buccal surface, into the cervical area

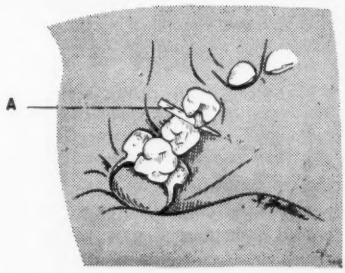

FIG.5. A. WOODEN WEDGE IN PLACE BEFORE PREPARATION OF CAVITY.

of the interproximal space of the carious tooth. Occlusal displacement of the wedge by the dam can be obviated readily by placing a No. 3 Hollenbeck carver on the lingual surface of the teeth in question and pressing the dam gingivally while the wedge is being forced lingually (Fig. 5). The wedge depresses the gingival tissues sufficiently to facilitate accurate preparation of the cavity cervical floor.

10. *Continuous Matrix Band.* Dislodgement of the matrix holder can be prevented by using a continuous matrix band prepared in this way: Use a pair of band-forming pliers or Goslee pliers to form a strip of stainless steel banding material (.002 x 3/16 inch) around a prepared tooth. Then remove it and tack weld it (Fig. 6). Cut the free ends of the band and replace it on the tooth. If several compound cavities are prepared, more than one band may be used. With the bands held securely in place a wooden wedge is again used inserted between them at the gingival to obtain perfect gingival adaptation and sufficient tooth separation (Fig. 7). After the fillings are inserted, good contact will be restored when the wedge and matrices are removed.

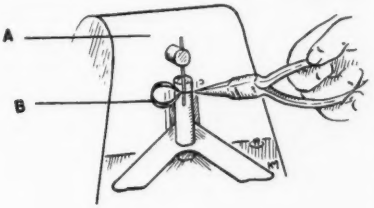

FIG.6. A. ROCKY MOUNTAIN WELDER. B. MATRIX BAND.

Conclusion

Adherence to the steps outlined in this technique for quadrant dentistry for children will be most rewarding. First,

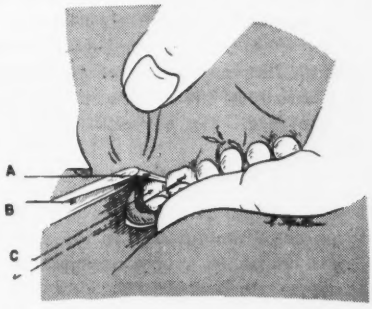

FIG.7. A. WOODEN WEDGE. B. HEMOSTAT. C & D. MATRIX BANDS.

more can be accomplished because the operation is painlessly performed. Since the task is a painless one, apprehension is replaced by patient confidence and cooperation.

Second, a clean area of operation, free from saliva and wet debris, made possible by the rubber dam, results in better dentistry more efficiently done.

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Unit News

MID-YEAR has come and gone, friends, and we're well on our way toward the autumnal equinox. But that hasn't slowed down ASDC activity one iota. This quarter, no less than 22 Units are reporting—just one shy of our previous all-time high.

Once again, I cannot help but express a word of thanks, bend the knee, and doff the old typewriter to those of you who have been so cooperative. I still have hopes of getting reports from *all* Units for one issue. Perhaps that is Utopian—guess I'll continue to be happy with what I've got. So—let's blast off!

Arkansas

Basil Gibbs, newly elected secretary-treasurer of the Razorbacks, submitted a fine additional report on his Unit's activities. He and E. H. Dildy, Unit president, have been appointed delegate and alternate, respectively, to the Dallas Convention. Basil also points out that crops were late out there because of all the water in the Spring. But, he goes on to say, that only made for a lot of fish, and "I assure you the Arkansas boys are getting their share!"

Prior to his letter, however, retiring secretary R. L. Smith, Jr., mailed in a detailed write-up so good that here it is *in toto*:

Once again ASDC shone like a light at the recent 70th Convention of the Arkansas State Dental Association. One of the featured clinicians of the meeting was Dr. Olaf H. Jacobson who spoke to the convention assembly on Monday morning. Olaf was the guest of the Arkansas Unit, and speaker, at our annual breakfast meeting at 7:30 a.m., April 14 in the beautiful Continental Room of the Marion Hotel. His presentation of "Posterior Steel Crowns in Primary Teeth" was excellently given. It was a practical and thorough clinic supplemented with movie and slide visual aids that we found would have many practical applications in pedodontics.

Our meeting was well attended with over 50 present. Dental assistants and dental hygienists as well as non-member dentists were on hand also. Some of our guests were Miss Janice Jacobson of Tulsa, Oklahoma, the 8th District Trustee of the A.D.A.A. and Miss Sarah Hill of the University of Tennessee, a past-president of the A.D.H.A.

Welcomed as new members were Clark Stancil, Lewis Horton, Jack Tucker, C. E. Oates, and Wayne Biggs.

President Luten was pleased to announce that Robert "Dusty" Malcolm, one of our members, had been selected to be the State Coordinator for the Arkansas State Dental Association for the 1959 observance of National Children's Dental Health Week. Congratulations, "Dusty."

The report of the nominating committee chairman, Haile Bowers, was accepted and the following slate of officers was elected by acclamation:

President: E. H. Dildy, Hot Springs

Vice-President: R. L. Smith, Jr., Little Rock
Sec.-Treasurer: Basil Gibbs, Star City

Executive Council:

North West District: Ralph Bowers
North East District: D. E. Newberry
Central District: Bill Cloud
South West District: Horace Beene
South East District: F. O. Wardlaw

As has happened in the past, a large number of table clinics this year was presented by our members. Pedodontics and related subjects were in predominance for these clinics.

Plans are already being formulated for our Fall Seminar meeting in Hot Springs National Park, Arkansas, in October. Everyone is invited.

And there you have the combined efforts of two conscientious workers to produce a really first-rate report!

Northern California

Vol. 1. No. 1, of the *Newsletter* from this Unit made for fine reading. It is an ambitious project, and editor Claude Warden is off to a good start.

Their Third Annual Pedodontic Seminar, held in September in Yosemite Valley, was "sold out" long in advance and attests to the fine job done by the arrangements committee—and the interest of the men out west.

On April 21, Dr. Francis Howell, noted for his work in Oral Pathology, spoke on the "Signs and Symptoms of Oral Lesions and Tumors Found in Children and Young Adults." His lecture was presented at the annual Pedodontic Breakfast held during the Northern California Society meeting. President-elect Ron Light was program chairman. Just two days later, the Unit was fortunate enough to have our national president, Al Anderson, as part of a panel on pedodontics. In addition to Al, the following men participated: George Boone, Pasadena; John Barker, Oakland; and I. Irwin Beechen, Oakland. The panel was moderated by Dean John Tochinni of the College of Physicians and Surgeons, and Eddie Mack did his usual fine job of handling the introductions Claude says one of the real highlights was being able to meet Al Anderson's young daughter, Kathy.

An overflow crowd showed up on May 14 for the quarterly meeting of the Unit. Dr. Fred Meyers, department of pharmacology, University of California Medical School, was the guest speaker. He more than adequately covered the three drug groups—1. sedative-hypnotics; 2. narcotic analgesics; and 3. tranquilizers. He was bombarded with questions so he must have presented some provocative information.

Busy, busy! Keep up the good work, fellows.

Southern California

Moving south on the west coast, word comes of the annual meeting held in Los Angeles on June 9. Unfortunately, the list of new officers had not arrived by press time. But a report that Dr. Robert Ricketts presented a fine lecture did arrive. His subject was "Cephalometrics."

This was Mode Perry's last meeting as president, and although I am sure his fellow members were sorry to see him step down, Modie (as they call him) is probably glad to let somebody else have the responsibility for a while. I do know Robert Read was the president-elect, and, apparently, is president —but who else got elected?

Colorado

During the past year, the Unit held a series of meetings on the subject of

growth and development of maxilla, mandible, and associated structures. To climax this study, a two-day seminar was held on May 24 and 25. Dr. Edward Cheney, associate professor in the department of orthodontics, University of Michigan, was the main clinician. His topic was "Interceptive Orthodontics."

On the second day of the seminar, he shared the program with Dr. Donald Bourg, acting director of the Children's Psychiatric Department at the University of Colorado Medical School. This discussion dealt with oral habits and their cause and effect.

A special committee is already studying proposed topics for the next year's study. So far, under consideration are "Dental Management of the Exceptional Child" and "The Endocrines and Their Effect on the Child's Growth and Development."

Also during the past year, much progress was made in the effort to secure excused absences from school for dental appointments. Numerous meetings were held with public and parochial school officials, the Colorado State Dental Association, and the Colorado State Department of Public Health.

A hearty welcome has been extended to two Unit members—Ben Kletzky and Bill Cody—who have recently returned to their offices after undergoing major surgery.

And all that fine wordage comes from Lou Dubin. Thanks, friend.

Florida

Daytona Beach was the site of the summer clinic meeting for the Gator state on August 23 and 24. Dr. John A. Anderson, Chicago, was the clinician, and his subject was "Dental Practice Management and Operating Efficiency." (I heard him in Atlanta a few months ago, and he really has some good ideas.) Editor John Tabak reports that a fine crowd was on hand to learn how time and motion studies can apply to the dental office. State president Dudley Reep of Jacksonville presided at the business meeting which preceded the clinic.

Georgia

Highlight of summer activities in "my own, my native" state was the Fourth Annual Pedodontic Seminar which was held September 7 and 8. Each of the first three was held in Atlanta. This year the group assembled at Ida Cason Callaway Gardens, about 85 miles southwest of Atlanta. Among other things, this place has—supposedly—the largest man-made beach in the world, and it is truly a delightful location for relaxation.

Clinic sessions were held Sunday afternoon, Sunday night, and Monday morning. In-between activities included golf, swimming, fishing and a cocktail party. Wives and families were also invited to attend.

The three clinicians were all from Atlanta—also an innovation this year. Emile Fisher, a periodontist, discussed Periodontal Conditions in Children; John O. Wilson, rapidly becoming an authority on the subject, presented a lecture on Office Procedure and Design "which showed how the dental appointment can become a more pleasant experience for the patient as well as for the operator"; and Ted Levitas (a ringer) had as his subject "Let There Be Light" which dealt with the role of radiology in dentistry for children and briefly touched on some of the misconceptions concerning radiation.

Membership in the Unit is still growing. At the latest report, the following men were welcomed: Harold Lanier, James B. Carroll, Jack A. Bell, C. C. Redding, C. E. Mixon, Jr., Gerald Reed, James Dickinson, M. W. Kent, and Herschel Isaacson.

An enthusiastic group of officers has kept the ball rolling this year, and it looks like it will be a successful one.

Idaho

Wes Young reports that the annual meeting on June 15 was a huge success. It was held at Shore Lodge in McCall. President Al Anderson travelled east this time to be their clinician—and, as usual, did a fine job.

Dale Ablin was installed as president. Frank Hyke, Lewiston, was named president-elect, John Bideganeta, Mountain Home, vice-president, and Wes Young, Boise, secretary-treasurer.

In September, the members participated in the third annual Pacific Northwest Conference on Children's Dentistry which, once again, was successful. It was held this year in Gearhart, Oregon.

Illinois

Reporter Bert Gilbert, Springfield, brings us up to date from the beginning of the year.

The first 1958 meeting was held in Chicago at a luncheon during the Mid-Winter Dental meeting. Peripatetic Editor Al Seyler was the featured speaker, and, says Bert, did his usual fine job. In addition to their own members, the Unit welcomed 27 out-of-staters.

The second meeting on May 13 was a "first." It was held in Springfield which made it the first time the Unit had met out of Chicago. So well received was it, that 11 late-comers had to stand. Ralph Phillips of Indianapolis spoke on "Dental Materials in Dentistry for Children." Bob Pollock, Oak Park, president of the State Dental Society, was in charge of this particular meeting and deserves a "big hand" for a fine job. (See cut.)

Photograph taken in the Abraham Lincoln Hotel, Springfield, during the annual convention of the Illinois State Dental Society. Shown, left to right, are Ray Van Dam of Chicago, chairman of clinics; Charlie Carpenter of Hinsdale, president of the Illinois Unit; Bob Pollock of Oak Park, president of the Illinois State Dental Society; Ralph W. Phillips of Indianapolis, clinician for the meeting; and, Bob Dormire of Springfield, chairman of exhibits.

Back to Chicago is the word of the October meeting. Program chairman Norm Olsen has secured ASDC president-elect Harold Addelston as the clinician. He will present an afternoon-evening program, and the annual business meeting and election of officers will also be on the agenda.

"Good show" from Illinois—and thanks, Bert.

Massachusetts

The Back Bayers elected new officers in May. Charles Boyers was elevated to the office of president. His fellow officers are: Leon Young, vice-president; Robert Diamond, secretary-treasurer; and Bob Kirschbaum was returned to the office of editor—which he fills admirably!

Dr. Kenneth Easlick, University of Michigan, was the speaker at this meeting and chose as his subject, "Where Is Research Leading Us?"

Memphis Section

Still don't know who our reporter is from this branch of the Tennessee Unit, but here is additional information about the Section's ambitious program.

On September 25, an interesting program was presented by the Memphis Cleft Palate and Lip Clinical Group. This team is supported by funds from the states of Tennessee and Mississippi and has been providing a unified team approach in West Tennessee and North Mississippi in this important field of dentistry. Members of this group are: Lorenzo H. Adams and Leigh K. Haynes, plastic surgeons; Charles E. Long, otolaryngologist; Ralph E. Braden and Faustin N. Weber, orthodontists; W. K. Boren, pedodontist; C. L. Raines, prosthodontist; and Miss Jean Gilford, speech therapist.

Two active researchers in the department of pathology at the University of Tennessee will be the speakers for the October 23 meeting. Their topic will be "Systemic and Oral Mainifestations of Children's Disease." Bert Lemming is the physician member of this duo and James Smith is the dentist. Both men are working under U.S. Public Health grants.

November and December draw blanks, but activities resume again on January 22, 1959. "Armamentarium in Children's Dentistry—High Speed vs. Conventional Techniques" is the tongue-tieing title for an important subject. James McKnight will be the moderator, and the panel will be made up of B. H. Kubik, Chester Lloyd, Tom Pyron, and Wallace Reid. Should be a most worthwhile meeting.

This section is more active than some of our Units—or so it seems. Keep up the fine work, and thanks for the report—but, dear correspondent, please tell me who you are!

Michigan

William T. Graetz is the new president of the Michigan Unit and has to serve with him Ronald J. Jenkins, vice-president, and Zalman Konikow, secretary-treasurer (and reporter-without-portfolio).

The first meeting in the Fall will be held in conjunction with the Detroit Pediatric Society. "Our own" Bill Brown, University of Michigan, will speak on "What Makes a Thorough Dental Examination for the Child Patient." Dr. Lowry, pediatrician from the University of Michigan Medical School, will have as his subject "Physical Appraisal of the Child by the Dentist: How It May Produce Better General Health."

Moving on into the next year, past

president George H. Guest has been named chairman of next February's Children's Dental Health Week. Also in '59, the April meeting will pay tribute to the dental hygiensts of Michigan. Looks like the new year will be off to a rousing start!

A personal communication arrived from Hugh Kopel in Detroit. Hugh takes exception—and rightly so—to an item in Florida's Second Quarter report.

The item was that the first dental clinic within a Cerebral Palsy center was being set-up in the 'Gator State. Hugh reminds us that Detroit has had—for the past five years—a dental clinic in the C.P. Center. He and Tom McGraw are dental staff members. Their clinic completes all dental treatment for each child before he graduates from the preschool classes and also takes care of a number of outpatient children of various ages.

Oh, yes—one more word from Hugh. He reports that there was an interesting three day session in Philadelphia recently under the direction of Manny Album. The workshop dealt with the care of the handicapped child and was sponsored by the U.S. Department of Health, Education, and Welfare, Division of Vocational Rehabilitation, in cooperation with the University of Pennsylvania.

Minnesota

Three Minneapolis members were named as delegates to the National meeting. They are: Robert Boller, Irving Posnick, and L. H. Schwarzrock—our reliable reporter.

September 12 was the date of the Ninth Annual All-Day Meeting sponsored by the Unit. This year's clinicians were Ralph McDonald and Laren Teutsch, both eminently qualified to appear before the group. Dr. McDonald spoke first on "Vital Pulp Therapy" and then on "Traumatic Injuries to Permanent Anterior Teeth." At the morning session, Dr. Teutsch discussed "Operative Dentistry," and in the afternoon, he spoke on "Practice Administration and Office Planning."

This meeting will be followed by a symposium on "The Practical Aspects of Caries Control in Children." The date has been set for October 21, and Harold Wittich, pedodontics staff at the University of Minnesota, and Joe Cohen, Minneapolis pedodontist, have already been named to the panel. Two more names are to be added.

The three above named delegates will present their report on the Dallas convention as the program for the November 18 meeting. (This puts these boys on the spot—they have to attend all the sessions!!)

Montana

Fred Schwin, Red Lodge, has taken over the reportorial duties, and his first effort is jam-up! Here 'tis in original form.

The Montana Unit of the American Society of Dentistry for Children held its 4th annual Spring meeting at Canyon Hotel in Yellowstone National Park June 21 and 22. About 35 Montana dentists and their families attended, and president B. F. Kluge presided.

Dr. Bill Humphrey of Denver was our guest clinician and in spite of all the outside attractions, he held the attention of all the attending dentists for all sessions of his day and one half of clinic and discussion. We are grateful to Dr. Humphrey for his fine presentation of so much worthwhile material to our group.

At the business meeting R. K. Schroeder of Whitefish was elected president for the coming year. Elected vice-

president was L. E. Hall of Missoula and saddled with secretary-treasurer was Fred R. Schwin of Red Lodge.

V. V. Crissy of Livingston, who just finished serving four years as secretary-treasurer, was named to a two-year term on the executive committee and John C. Gilpin of Bozeman to a three-year term.

T. T. Rider of Missoula, the first man in Montana to practice pedodontics exclusively, was voted to a lifetime membership on the executive committee. He was the organizer and first president of the organization. And, incidentally, this Spring a fifty year graduation award was presented to this grand dentist by his Alma Mater, the University of Iowa.

Wayne Thompson of Bozeman and Dr. Gilpin were chosen as delegates to the National convention in Dallas. Drs. Sam Rayfish of Butte and John Taylor of Billings were chosen as alternates.

Next year's meeting will be in Glacier National Park where we are looking forward to another real good session.

A summary like that really makes this job a cinch. And those fellows 'way up yonder sure have been busy!

New Jersey

Walter Schwartz, N. J., reporter, returns this quarter with a fine review of goings on in his area.

October 29 is the date for the All-Day Seminar which will be held at Seton Hall University College of Dentistry under the auspices of the Unit. Maury Massler is to be the guest lecturer.

H. Milton Cooper will serve as '58-'59 president and he will be assisted by Robert D. Moyer, president elect, H. Curtis Hester, vice-president; Wilfred W. Jordan, secretary-treasurer; and, of course, Walt as editor. The program for the 1959 Annual Mid-Winter meeting has already been planned. An afternoon session of table clinics will be followed by a dinner in the evening and guest speaker Robert Moyers, University of Michigan, who has always been well received in the past.

It's good to see so many groups make their programs in advance.

New York

Once again, Charlie Beck comes through with a terrific reporting job as he brings us up to date on the eventful celebration of their 25th anniversary. As you may recall, the meeting was held last April in Rochester at the Eastman Dental Dispensary.

Harold Bowman, Roland Howes and their committee did a great job of preparing the honor ceremonies for the past presidents of the society, and most of these men were on hand to accept their special certificates.

Featured essayist was M. Michael Cohen of Boston. In addition, the following table clinics were presented at the Dispensary:

1. Patient Education and Office Techniques, The Central New York Practice Management Group.
2. Case Presentation and Economics, Raymond A. Kielich, D.D.S., Buffalo.
3. Presenting a Child's Case to the Parent, Leigh E. Fadden, D.D.S., Rochester.
4. Thruway Dentistry, George L. Jackson, D.D.S., Pittsford.
5. Taking a Second Look, David S. Maddox, D.D.S., Zanesville, Ohio.
6. Why Topical Fluorides?, Peter P. Dale, D.M.D., Rochester.
7. Space Problems and Preventive Orthodontics, Barnet Frank, D.D.S., Rochester.
8. The Origins of Periodontal Dis-

ease, Hyman J. V. Goldberg, D.M.D., Rochester; Frederick J. Halik, D.D.S., Rochester.

9. General Anesthesia in Dentistry for Handicapped Children, Harry I. Sulz, D.D.S., Buffalo.

10. Aids to Dentistry for Children, Maurice H. Dankoff, D.D.S., Rochester.

11. The Child Surgical Patient, James E. Bryan, D.D.S., Rochester; Donald J. Burke, D.D.S., Rochester.

12. Repair of Fractured Anteriors, James L. Dannenberg, D.D.S., Philadelphia, Pa.

Excellent contributions were also made by the Eastman Junior Staff consisting of Reginald J. Andlaw, L.D.S.-R.C.S., England; Roger J. Coe, B.D.S. (Lond.), L.D.S.R.C.S., England; Barrie R. D. Gillings, B.D.S. (Hons.), Sidney; Jacob D. Subtelney, D.D.S., and students.

Serving for the coming year along with Abram Kobren of White Plains are Arnold Rosenberg, president-elect, Yonkers; Roland Hawes, vice-president, Rochester; Charles Beck, secretary-treasurer, Tarrytown; and Joseph H. Kauffmann, editor, New York City.

Dr. Nicholas DiSalvo, Chairman of the department of orthodontics at Columbia University, will be the speaker when the Unit meets in Poughkeepsie on October 17 and 18. Table Clinics and a special program to entertain the ladies are already scheduled. The annual meeting will be held next spring in Albany and will be the last full-fledged get-together before the national ASDC meeting convenes in N.Y. in 1959.

"Kudos" to Abe Kobren who has just been named director of the department of pedodontics at Seton Hall University College of Dentistry.

Charlie also tells us of the formation of two more local Sections—one in Westchester County and one in Long Island. And forthwith is the first report from the new

Long Island Section

March 24 was the organizational date, and Ovid Slavin, New Hyde Park, was elected first president. Other officers are Gerard H. Schoen, Baldwin, vice-president; and Sumner Cohen, Great Neck, secretary-treasurer. Program committee co-chairmen are A. J. Anastasio, Willisston Park, and Kenneth M. Platzer all of Rockville Center.

Ed Lusterman, Dan Tobin and Abe Kobren were all on hand to help the boys get off the ground. Apparently there is plenty a group like this can do. Maybe more Units should encourage development of these local Sections.

New Mexico

I. L. Voda writes that he (from Las Vegas), E. M. Finnerty of Deming, and Nat Weitz of Carlsbad attended a postgraduate course in dentistry for children at the W. K. Kellogg Institute of the University of Michigan during part of February and March. This course was made available to these men by the New Mexico Dental Association, Dental Division of the State Health Department, and the Kellogg Foundation. He says it was enjoyed by all—and that's not hard to understand. Still don't understand, though, how they arranged it. Maybe some other states would be interested. Any details, I. L.?

North Carolina

Seems like more and more reporters are developing styles of their own—and this I like. Roy Lindahl, the personable correspondent from the Tar Heel state

comes through with a corker. Judge for yourself:

On Thursday, April 3, 1958, the Unit was privileged to have as its featured speaker at its 4th annual seminar in Chapel Hill, Dr. Ralph L. Ireland, professor and chairman of the Department of Pedodontics, University of Nebraska. Dr. Ireland spoke on "Modern Technics for Treating the Child Patient." Approximately 135 members of the North Carolina Dental Society attended this meeting as guests of the North Carolina Unit. During the course of the day, the annual business meeting for the Unit was held, and the following officers were elected for 1958-59: President, Don Henson, Kinston, North Carolina; President-Elect, W. K. Griffin, Durham, North Carolina; Secretary-Treasurer, Roy L. Lindahl, Chapel Hill, North Carolina.

On May 4, the Unit held its annual meeting in conjunction with the North Carolina Dental Society at Pinehurst, North Carolina. William W. Demeritt, our program chairman, provided us with another fine speaker in the person of Dr. Louis I. Grossman, from the School of Dentistry, University of Pennsylvania. Dr. Grossman's topic was "An Evaluation of Traumatic Injuries to Young Permanent Teeth." This program was also well attended. Following the discussion by our guest speaker, the Unit installed its newly elected officers and also took action on some very pertinent recommendations for the elevation of dentistry for children in the state of North Carolina. These recommendations were approved by the house of delegates of the North Carolina Dental Society.

Pennsylvania

Another new correspondent comes through with a communique this time —Mort Winkler, retiring secretary-treasurer of the Unit. He has been made president-elect, C. Harlin Shope, Middletown, is vice-president, and Samuel D. Karabel, Philadelphia, is the new secretary-treasurer. Mort, incidentally, hails from Pittsburgh.

Word also comes that another local group has been formed—this time the Central Pennsylvania Section. Good luck, men.

And this becomes a good time to hear from the

Western Pennsylvania Section

May 6 was the date and Pittsburgh the site of a meeting when Dr. Bertram R. Girdany spoke on "The Problems of X-ray Radiation and Radiology Pertaining to the Subject of the Skull in Systemic Diseases." Dr. Girdany is associate professor of Pediatrics and Radiology at the University of Pittsburgh School of Medicine.

So thanks to Jesse Quatse, publicity chairman, for bringing us up to date.

Rhode Island

"Emotional Factors Underlying Behaviour of Children During Dental Treatment"—now there's a subject I'll bet everyone of us would like to hear discussed. Well, the Rhode Islanders heard it on June 3. Dr. Hector Jaso, new director of the Providence Child Guidance Clinic, was the speaker.

At this meeting, the last of the fiscal year, Ulysses T. Carter, Jr. was elected president, Lee C. Nathans was named vice-president, and Herbert J. Underhill, Jr. was entrusted with the records as the new secretary-treasurer.

Friend Lee also reports that an increase in dues and members has put the Unit in a sound financial position and

Officers of the Tennessee Society of Dentistry for Children are shown after the unit's annual meeting in Chattanooga May 11. From left are Dr. R. Parker Graham, Nashville, vice president; Dr. Robert F. Taylor, Memphis, president-elect; Dr. Robert E. Pope, Chattanooga, retiring president, and Dr. Paul O. Young, Nashville, reelected secretary-treasurer. Dr. B. F. Gunter of Nashville, the Unit's new president, was unable to attend the Chattanooga meeting because of an eye operation.

that they're rarin' to go into another banner year. They have 78 members, and the meetings have induced nearly 50 per cent of this number to come out.

Tennessee

New president B. F. Gunter of Nashville filled in as reporter this quarter. He reports that Robert Taylor of Memphis is the president-elect, R. Parker Graham, of Nashville is vice-president, and Harold C. Meacham, Jr., Nashville, is secretary-treasurer. Paul Young had been reelected to this position, but, subsequently, found it necessary to resign.

Committees have been appointed and programs will be coming up. Already, plans are being formulated for the annual meeting on May 11, 1959, in conjunction with the Tennessee State Dental Convention which will be held in Nashville.

Texas

Preparations for the national meeting are keeping all "them thar cowboys" busier than a cowhand branding a recalcitrant heifer! Max Sharpe tells me that Harold Scott of Sherman (we don't mention *that* name around here, podner!) is doing a great job as chairman of the Unit's membership drive. Get this —25 new members were signed up in one month!

Nice going—hope to see you in November!

Addenda

During the 11th Annual New Orleans Dental Conference, Nov. 23-26, Roy M. Wolff will be one of the clinicians. His subjects will have to do with preventive dentistry and ways of acquiring a "pleasant" and profitable children's practice.

If you care for more details, write to the New Orleans Dental Conference, 4704 Parish Avenue, New Orleans 22, La.

* * *

Tufts University School of Dental Medicine is offering the following postgraduate courses: Operative and Nutritional Procedures for the Management of Rampant Caries—Nov. 10-11; Clinical Dentistry for Children, June 15-16, 1959; Orthodontic Principles of Interest to the General Practitioner, Feb. 4 to

March 25, 1959 (each Wednesday); and Cephalographics and Diagnosis, January 14-16, 1959. For details, write to the school, Division of Graduate and Postgraduate Studies, 136 Harrison Avenue, Boston.

* * *

More courses: W. K. Kellogg Foundation institute, University of Michigan, Ann Arbor, Mich.—Dental Treatment for Handicapped Children, November 17-18, 1958, and March 16-17, 1959; and Dentistry for Children, February 23-March 6, 1959, and May 18-29, 1959. Use the above addresses for more info.

* * *

And another one: New York University's College of Dentistry will offer an eight month postgraduate course in pedodontics from September 17 to May 20, 1959. Get information from Director, Postgraduate Division, College of Dentistry, 209 East 23rd Street, New York, 10, N. Y.

* * *

Thanks to the Women's Auxiliary of the Philadelphia County Dental Society for presenting an x-ray machine to the Children's Hospital in Philadelphia. This hospital, now in its 103rd year, is the oldest in this hemisphere devoted exclusively to pediatric care. Nearly 200 receive oral care each month in the Dental clinic.

* * *

The Strong-Carter Dental Clinic in Honolulu has treated 58,442 children in the past 37 years. Under the supervision of Dr. John H. Dawe, who has been director since 1934, this clinic has made a lasting contribution to the dental and general health of the children in its vicinity.

This clinic is doing an excellent job. If you would be interested in reading the latest annual report—which would probably open your eyes—write to Dr. Dawe at Palama Settlement, 810 North Vineyard Street, Honolulu 17, Hawaii.

* * *

Havana's Tony Montero has come through again. He reports that the Pan American Council of Dentistry for Children is making plans to participate in Children's Dental Health Week next February. He also reports that two new Units have been established in Equador at Quito and Ambato. Efforts are being made to introduce fluoridation there, and a scholarship for studies in pedodontics has been granted by the Pan American Health Office.

The Council will welcome "sustaining" members at $5.00 per year. Affiliate society members (such as those in the ASDC) are eligible. Write to Dr. Alicia Lazo de la Vega, Insurgentes 286-202 Mexico, D.F.

* * *

Here's a new one—The Federation Odontologica Centro America-Panama. Headquarters are Apartado Postal 698, San Jose, Costa Rica, C. A.

Raymond Pauly, associate secretary, is their correspondent, and his communique (which arrived as the presses began to roll) is passed on to you. If you want further information, write him at the above address.

"I wish to inform you that the Second International Convention of the Odontological Federation of Central America-Panama, will be held in San Jose, Costa Rica, in the University of Costa Rica Building of Basic Sciences,

from November 25 to November 29, 1958.

We will appreciate very much if you could give notice to all the members of your association, and at the same time I take pleasure to extend to you and to all the other members, a very cordial invitation to attend the meeting.

The subscription fee will be the amount of $20.00 U.S. and will enable registrants to participate in both the scientific and social events of the meeting.

I wish to inform you, too, that we are making arrangements with the airways companies and hotels in San Jose, in order to obtain special rates for those dentists who wish to attend the meeting.

If there are members of your society who wish to participate in the scientific section of the meeting, please let us know, so we can make further arrangements to include them in the program."

* * *

Fingers too sore for a Finale this time. But keep it coming, thanks for your help—and see you next time.

Editorials

EDITOR'S NOTE: *We reprint herewith, by permission, an editorial which appeared in the* American Journal of Orthodontics, *August 1958, together with a "reply" by Wm. E. Brown, chairman of the committee making the original report. The subject material of these two items is of interest to all who practice pedodontics, and we think you will be interested in the opinions expressed.*

A. E. S.

AN ANSWER TO "HOW MUCH ORTHODONTICS SHALL THE PEDODONTIST DO?"

THE question propounded here is discussed in the report of a study group of the American Academy of Pedodontics in the *Journal of Dentistry for Children*. (Brown, W. E., et al.: How Much Orthodontics Shall the Pedodontist Do? J. Dent. Children 25:3-8, 1958.)

The study group answers its own question when it states: "If he [the pedodontist or general practitioner] is informed and experienced in growth and development, etiology, diagnosis, and the treatment of malocclusion, the total care of a patient's oral health may be accomplished by one general practitioner." To the foregoing we say "Amen."

It is in order, however, to analyze the statement further, especially since the study group presents an outline of *types of malocclusion which could be treated by the pedodontist* in contradistinction to those which should be referred to the orthodontist.

It should be pointed out that, in order to be "informed and experienced" in the various phases of diagnosis and treatment of malocclusion, the pedodontist would have to obtain a graduate course in orthodontics. Since the present undergraduate dental curriculum, unless it is especially curtailed, is already too crowded, and the undergraduate dental student is hardly ready to pursue a course in orthodontics on the graduate level, we do not know where the study group expects the pedodontist to obtain the training and experience which it considers essential. If the dental colleges were to curtail their present curricula to include such a course as is advocated by the pedodontic study group, the present manpower shortage in dentistry would be further aggravated, and the profession is not now keeping up with the annual increase in population. Furthermore, most of those who take graduate courses in orthodontics tend to limit their practice and leave the field of general practice or pedodontics altogether.

The outline presented by the study group of the American Academy of Pedodontics differentiates among the following types of malocclusion:

1. "Functional malocclusions are produced by cuspal interferences, habits, or by other conditions.
2. "Skeletal malocclusions are produced by disturbances of bony growth.
3. "Dental malocclusions are produced by the malposition of teeth, such as those by malposed individual teeth, by early loss of teeth, or by other conditions."

The term *malocclusion,* as we understand it, refers to malrelation of the teeth when the upper and lower dental arches are in centric occlusion and to irregularities in the respective dental arches. Malocclusion can be said to be present also in arches with well-aligned teeth when the accepted dental formula and interarch occlusion are disturbed.

Functional malocclusion which involves muscle malfunction rarely, if ever, is confined to the teeth alone and practically always involves disturbances of bone, even if it is confined to the alveolar bone only. As we have pointed out elsewhere,* the alveolar process is the "slave" of the teeth; where the teeth go, the alveolar process follows.

Treatment of anterior and posterior cross-bites, call them what you will, requires fine diagnostic judgment to determine where the fault lies.

We do not understand the differentiation made by the study group between distoclusion and Class II relationship. We do know that distoclusion is a feature of Angle Class II malocclusion. Orthodontists have described six types of Class II (Angle) malocclusion. The treatment of this classification of malocclusion requires clinical training and clinical experience.

The description of mesioclusion in the outline omits much that is to be desired. In New York City one woman is making a crusade on treatment of lingually occluding maxillary incisors by means of a tongue blade. She has formed an organization of lay people and is undertaking to give advice not only on the "tongue blade" treatment but on all phases of malocclusion. Some of the proponents of extraoral therapy (or is that the wrong term?) are now claiming to treat all forms of malocclusion by means of this "system." In many cases the diagnosis of Class III (Angle) malocclusion is far from being just a matter of looking at the plaster casts. There are other points in the outline that would bear clarification.

There is no questioning the fact that the pedodontist should possess a deep understanding of orthodontic problems as they occur in his patients. There is great need also for a more sympathetic and practical understanding of the pedodontist's problem on the part of the orthodontic specialist. The danger to the patient lies in the treatment of children by the pedodontist and general practitioner who feels that he has a "right" to practice orthodontics without the preparation advised by the study group. Evidence of this danger is already well known to orthodontists who are now receiving into their practices an increasing number of children whose malocclusions had been "treated" elsewhere.

The pedodontist can make important contributions to the prevention of malocclusion, to the maintenance and guidance of the developing dentition of the child, and even to the treatment of incipient conditions. However, there is a great need for further cooperative study between pedodontists and orthodontists. We do not think that a definitive answer is available at present on this subject; nor is it contained in the outline presented by the study group.

* Salzmann, J. A.: Orthodontics: Principles and Prevention, Philadelpha, 1957, J. B. Lippincott Company, chap. 10.

The question has been asked: "What is the difference between a *major* and a *minor* surgical operation?" The answer is that a major surgeon makes a major operation a minor one, while a minor surgeon makes a minor operation a major operation. There is great need for an increasing number of major operators in orthodontics. We believe that, while underlying philosophy of the study group is valid, the outline as it now stands requires much additional study.

It would be an act of supererogation, if not downright self-seeking, for orthodontists to insist that the treatment of malocclusion be done by orthodontic specialists only. It is their duty to the public and to the child population, however, to point out the dangers attending the practice of orthodontics by those not qualified to do so. In this we are in full agreement with all practicing dentists.

J. A. S.

AS WE SEE IT!

THE accompanying editorial which appeared in a recent issue of the *American Journal of Orthodontics* critized a report of a study-group of the American Academy of Pedodontics entitled, "How Much Orthodontics Shall the Pedodontist Do?" which appeared in the issue of this Journal for the First Quarter of 1958. The objective of the report by the study-group was to "stimulate more dentists to become thoroughly informed and experienced in the diagnosis and treatment of problems of growth and development of the teeth and their suporting structures."

The editorial in the *American Journal of Orthodontics* stated that "The pedodontist can make important contributions to the prevention of malocclusion, to the maintenance and guidance of the developing dentition of the child, and even to the treatment of incipient conditions." With this statement the study-group would agree freely. However, the editorial expressed the viewpoint that the training required for the pedodontist to manage the occlusal problems outlined by the study-group would be difficult or impractical to achieve. The editorial again may be quoted, "Since the present undergraduate dental curriculum, unless it is especially curtailed, is already too crowded, and the undergraduate dental student is hardly ready to pursue a course in orthodontics on the graduate level, we do not know where the study-group expects the pedodontist to obtain the training and experience which it considers essential."

Apparently the meaning of the word pedodontist is not clearly understood. It should be pointed out that a pedodontist is not simply a graduate dentist who decides to restrict his practice to children. Much more than that, he is a dentist who pursues two years of formal education in an approved graduate center or secures an equivalent experience. The American Board of Pedodontics insists that a completely qualified pedodontist must be thoroughly informed in the area of "interceptive orthodontics." The Board states in its booklet on qualifications, "The preventive and palliative orthodontic treat-

ment which the pedodontist should become qualified to perform must be based on a comprehensive knowledge of the diagnosis of present occlusion and the potential growth and development of the arches. Such a qualification will require formal instruction and clinical demonstration."

Graduate students in pedodontics studying in several educational centers are becoming as informed and experienced in growth and development, etiology, and diagnosis of malocclusions as are the graduate students in orthodontics. However, the graduate student in pedodontics is not being educated to manage the orthodontic problems which require comprehensive procedures of treatment. In at least one graduate school the student in pedodontics receives at least as much education in the diagnosis and technics of "interceptive orthodontics" as the graduate orthodontic student. It is, of course, quite possible that a pedodontist with this comprehensive background may err occasionally in diagnosis or treatment. It is equally possible that the highly-skilled orthodontic specialist also may err.

In many areas of North America the pedodontist and the orthodontist work together closely. It matters little who treats the malocclusion as long as the patient is served in a scientifically satisfactory way. The orthodontist has contributed generously in time and skill to the education of the pedodontist, and it seems obvious that this trend will continue, certainly if dentists are to qualify for the examination of the American Board of Pedodontics. The report of the study-group has stimulated a scholarly editorial from a friend qualified as an orthodontist. The editorial may be cited as evidence of the mutual desire of both the orthodontist and pedodontist to serve the public better. That there is need for additional study by both groups may be taken for granted.

W. E. Brown

Oral Surgery for the Cerebral Palsied Child*

ABBE J. SELMAN, D.D.S., M.S.**

A CONSIDERATION of the management of Oral Surgery for the cerebral palsied child requires at least an outline of the surgical field. No special oral surgical conditions affect the cerebral palsied child. Like the normal child, he requires surgical removal of primary and adult teeth, excision of dental impactions and supernumerary buds, and extirpation of root fragments and odontogenic growths. He may also need orthodontic surgery, surgical correction of hyperplastic tissues, lingual or labial frenectomy and root end surgery or apicoectomy. Special care in Oral Surgery is necessary for rheumatic and congenital heart disease, blood dyscrasias, diabetes, and acute and chronic glomerulonephritis. More than the normal child, the cerebral palsied child may be subject to fractured teeth and jawbones, lacerations of the tongue, lips and cheek, severe infections involving the teeth, jaws, mouth and associated parts, and to various oral and facial swellings, requiring diagnosis and treatment, arising from inflammatory, traumatic, cystic, neoplastic and congenital causes. It should be emphasized at this point that every effort must be made to preserve the dental tissues of the cerebral palsied child and to avoid surgery. Replacement after surgery is often so difficult as to be impossible.

Outside the framework of organized care for the cerebral palsied children, the response to special management problems has been, too often, neglect of the cerebral palsied child, or the shifting of the problem from one therapeutic agency to another. Organized cerebral palsy care, on the other hand, has developed excellent methods for unequivocal treatment which may be used safely and effectively for obtaining radiographs, injection of local anesthetics and the performance of most minor oral surgical procedures. Without these special techniques, as a matter of fact, any attempts at radiography, local injection or surgery would prove hazardous.

The dentist trained in restorative dentistry for cerebral palsied children possesses, therefore, the necessary fundamentals for uncomplicated oral surgical procedures for these children. However, since Oral Surgery, whether pediatric or adult, often entails loss of a part rather than its restoration, or the sight of blood and manipulation of unusual instruments associated with emotional disturbances, special preparation for surgery of the cerebral palsy trained dentist is desirable.

This special preparation should consist of 1) additional training and experience in pediatric oral pathology, and in pediatric Oral Surgery under local anesthesia, 2) application of the methods developed for cerebral palsy reconstructive dentistry to cerebral palsy Oral Surgery, 3) creation of techniques for simplified and non-overt instrument manipulation, and the 4) development of adeptness, facility and judgment, which

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make for a short procedure and permit retreat, if necessary, without creating anxiety in the patient.

With this background the general practitioner may easily perform minor oral surgical procedures under local anesthesia, using the special methods, equipment and techniques developed for cerebral palsy dentistry. Owing to the excellence of the dental personnel usually concerned with the care of these children; to the desire on the part of these children to cooperate with the strong, kind person which the doctor comes to represent; and to prior establishment of good relations through the performance of other procedures, it may be possible to complete even more advanced surgical procedures with the cerebral palsied child than with the normal child having little relationship with his doctor. The resulting success experience in this area may even prove beneficial to the emotional maturation of the child by helping to crystallize his own self-esteem and self-confidence. It may also help inure him to, and teach him acceptance of, the temporary discomforts of necessary dental care. Furthermore it may strengthen the important doctor-patient relationship through this fulfillment of trust and confidence. If the cerebral palsied child will cooperate in a minor Oral Surgery procedure, with local anesthesia and the special techniques developed for dental care of the cerebral palsied child, then this form of management should be followed for the beneficial, long-term results it may bring.

However, considerable care is necessary in choosing the child and the procedure for surgery in the conscious state. If successful immobilization of the child is doubtful, or the doctor's ability to complete the particular operation with finesse and dispatch is questionable; if prolongation of the procedure with evidence of difficulty and physical or emotional trauma to the child is possible, then conscious management of the case is ill-advised.

Even a normal child, when undergoing a dental experience he is not emotionally capable of withstanding, will regress in this area. The result may be a severe destruction of confidence. There is a marked difference to most children between oral restorative procedures and surgical ones. The child usually looks upon the former as additive or constructive, and upon the latter as extirpative or destructive. The reaction to surgery may be even more severe, then, than the reaction to restoration.

On this score, cerebral palsied children present additional complicating factors. Some of these have been outlined by Dr. S. Nichtern, Chief of Child Psychiatry at Bellevue Hospital, who showed that a percentage of children with organic brain disorders may be subject to a variety of psychological distortions and delays in maturation. These interfere with normal personality development, and are often expressed in deficient body image concepts, and in spatial disorientation. A diffuse anxiety commonly arises from the child's inadequacies in perception, language, and locomotion, and may contribute to failures in personality integration.

The brain damaged child is, therefore, physically more vulnerable to stress in general. He is a more dependent child, with possibly inadequate concepts of his environment. Emotional immaturity may be expected in many cases if only because of his separation from normal experiences and social pursuits

of his contemporaries. Furthermore, the poor body image formation, which Nichtern demonstrated in human figures drawn by brain damaged children, lead to an overemphasized importance of the mouth, eyes and nose. The head becomes the center of the body, with the remaining corporal areas assuming a position of relative unimportance. The tremendous meaning attached to the orofacial area by the brain damaged child translates any threat to the mouth into a threat to the entire body, and psychologically he becomes more vulnerable than the normal child to stress on the oral level. He is, therefore, less likely to have a good understanding of what the oral surgeon wishes to do, and explanation may mean very little to him. Rather, he needs added support during stress in terms of kindness, sympathy, and a tender firmness. Very frequently he is even better served by complete detachment from the conscious experience.

A decision in favor of complete detachment of the child from the surgical experience denotes the use of general anesthesia. General anesthesia for oral surgery may be administered on an ambulatory basis in the office, or on a semi-in-patient or complete in-patient basis in the hospital. As an ambulatory office patient, the child appears at the office and leaves it within an hour or two. As a semi-in-patient, the child is hospitalized for a considerable portion of the day. As a complete in-patient, the child may spend an overnight or even more than one day in the hospital.

From the surgical standpoint, these approaches are not significantly different, one from the other. The same pathology and tissues are present whether the operation takes place in the office or in the hospital. However, most oral surgical procedures are more advantageously performed with ambulatory office anesthesia.

In most instances the total competence and experience of the active personnel, as well as the facilities provided for the special oral surgery procedures, are greater in the well-managed and specifically designed oral surgery office than in a general hospital, which is designed for diffuse functions. There are, of course, those oral surgical procedures which must be performed in the hospital. The choice depends on the surgeon's skill and experience; on the length and complexity of the case. There is, therefore, no standard rule, and customary procedure varies from surgeon to surgeon. It should be noted, however, that most oral surgery procedures fall within the 5-15 minute category, lending themselves to office management.

Some of the advantages of ambulatory anesthetic office surgery, as against hospitalized or in-patient surgery, include the following:

1. Office procedures and ensuing recovery period often require only minutes, whereas hospital procedures usually require several hours or even a day.

2. Separation of mother and child is extremely brief in the office procedure, and may be even unknown to the child in most instances. In the hospital, the child may be separated from the parent for extended conscious periods, even overnight in many instances. The former is desirable not only for the child but for the parent as well.

3. A pleasantly appointed and cheerful office, and a brief ambulatory anesthetic and surgery, without conscious separation from the parent, is less likely to frighten a child than a large, imposing and awesomely impersonal hospital

where considerable time may be spent in the presence solely of strangers.

4. Hospital personnel are usually trained principally in adult anesthesia, and are accustomed to anesthesia consistent with more demanding, complex, prolonged and painful surgery, e.g., orthopedic, chest, and abdominal surgery. Anesthesia of such depth is not necessary for the average oral surgery procedure, and is an added strain, best avoided except for those procedures requiring it specifically. Office anesthesia and nursing, on the other hand, are consistent with the special surgery being done and with the individual child's needs. This is not always possible to the same extent in the general hospital.

5. Finally, the cost of routine hospitalization of the patient for the average oral surgery procedure cannot be borne by the general patient population. The higher anesthetic, hospital and surgical fees which this entails are best circumvented by the more efficient, and less time-consuming and costly methods developed for office oral surgery.

Oral surgery for the cerebral palsied child includes, therefore, both surgical and anesthetic management. The child, as a general anesthetic case, is more difficult than the adult on several scores. His higher metabolic rate and reflex irritability, require a greater percentage of oxygen as well as a stronger concentration of anesthetic agent. His greater surface: mass ratio leads to more rapid exchange of gases with alternate deepening and lightening difficult to control. His intellectual and emotional immaturity result in greater preanesthetic hyperexcitability with further increase in metabolism. And his fears and fantasies often result in forms of behavior which greatly increase the anesthetist's difficulties. The physical differences between child and adult, such as surface: mass ratio, cannot be altered readily. Consequently, the widest margin of safety and swiftness of recovery should be sought in the employment of inhalation anesthetics. With these anesthetic agents, depth can be altered critically and swiftly, with minute by minute control, according to the state of the patient and the requirements of the operation. Intravenous and rectal agents for children unfortunately do not possess these characteristics.

The metabolic, emotional and behavioral differences between child and adult may, on the other hand, be modified pharmacologically rather easily. By the use of proper premedication the child's emotional disturbance may be allayed and his metabolic processes slowed. The result is a smooth, swift induction, maintenance with decreased amounts of anesthetic and increased percentages of oxygen, and rapid and uneventful recovery. This is particularly important for the cerebral palsied child who already has a compromised cerebral blood supply, with possible motor inefficiency in respiration. In addition, because of the high incidence of nutritional deficiencies, organic defects, and general lack of robustness, he requires more preparation and attention than the normal child.

Time permits no more than a glimpse at the strides being made in the various phases of oral surgery which contribute to improvement of cerebral palsy care. Refinement of general anesthesia techniques for application in cerebral palsy care continues steadily. An area of research in this field suggesting potential reward is in the comparison of the effects of various anesthetic tech-

niques and agents on normal and cerebral palsied children, using such laboratory aids as the EEG and EKG. Surgical problems arising from malnutrition with vitamin and mineral deficiency, bone and soft tissue healing inadequacies, low resistance to infection, hemorrhage, and poor response to surgical shock and tissue trauma, are being investigated as to their response to new nutritional supplements, antibiotics, and hematological and hormonal supportives.

The most promising, and from a real standpoint practically untouched, area of investigation appears to be in the field of premedication. This rapidly expanding field warrants its own discussion. Consequently, it is wise to say only that it seems not unlikely, with the chemotherapeutic advances anticipated for the next few years, that the cerebral palsied child will eventually be provided dental care using a combination of premedicants for his immobilization, sedation, tranquilization, analgesia, etc.

At Harlem Hospital an investigation of a series of premedicants, and their methods of administration and effects, has been under way for some time. A preliminary report will appear in the literature soon, to be followed by other reports on the series. Extensive investigations in these and other related areas are essential, and are proposed for early consideration, with the sincere belief that highly rewarding results may be anticipated for the benefit of all children.

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Responsibility for Tooth Guidance Procedures*

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MICHAEL COHEN in his recent book, "Pediatric Dentistry," defined in simple terms the "practice of prophylactic orthodontics and tooth guidance as preventing something bad from getting started or preventing something bad from getting worse." Trying to define those areas in which the general practitioner and the pedodontist can be helpful in guiding the dentition of the growing child is a difficult and touchy task. Weber,[1] an orthodontist, lists ten malocclusions which "lie within the capabilities of the man in general practice to prevent as caused by:

1. Thumb-sucking
2. Lip biting, lip sucking, cheek sucking
3. Loss of proximal contact
4. Improper dental restorations
5. Ectopic eruption of first permanent molars
6. Impacted, unerupted, or supernumary teeth
7. Too long retention of primary teeth
9. Loss of permanent teeth
8. Loss of permanent teeth
10. Developing incisor cross bites."

Wessels,[2] a pedodontist, giving essentially the same thing in different language, likewise lists ten responsibilities in preventive orthodontics for the pedodontist as follows:

1. Maintenance of a healthy primary and young permanent dentition by prevention and treatment of dental caries, for the provision of normal function.
2. Detection, observation and correction of oral habits.
3. Observation and guidance of the interchange of dentitions relative to time and sequence.
4. Provision for adequate space for permanent tooth eruption, through prevention of space loss following premature loss of primary teeth, and restoration of space previously lost through tooth migration.
5. Interception of ectopic eruption.
6. Management of problems of aberration in number of teeth.
7. Management of dental malformations.
8. Dietary counsel for the child.
9. Evaluation of general health status of the child.
10. Recognition of potential orthodontic problems, not included in the above categories.

Then he adds, "It is obvious from this listing that this responsibility is not exclusively that of the pedodontist specialist, but must also be shared by all dentists who include children in their practices."

These items cover fairly well the whole gamut of preventive orthodontics, when one considers the maximum which can be done by the general practitioner and the pedodontist. However, responsibility must of necessity be tempered by experience and knowledge. Higley[3] stated the problem very well when he wrote, "While much can be done by the general dentist, it is not assumed that all

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* Read before Southern California Society of Dentistry for Children, Los Angeles, California, October 17, 1957.

preventive treatment is simple in nature. In fact, it takes more fundamental knowledge of growth and etiology and considerably better judgment and skill than does corrective orthodontics."

Let us consider the minimum responsibilities faced by the general practitioner in evaluating what can be done in a preventive nature to help the developing dentition of the child who is entrusted to his care. The first of these is a proper understanding of the nature of growth and development of the teeth and jaws so that as stated so aptly by Barber and Renfroe,[4] he should be more aware of the importance of "What should be done, and when it should be done, than how it should be done." A brief description of the growth process according to what we know today might be helpful. Let us divide the discussion into two phases, the hereditary forces and the environmental forces. Someone said that heredity determines the direction in which an organism moves, and environment determines whether or not it will ever get there.

The basic form of the infant skeletal pattern is predetermined by the genetic constitution of the individual. The size and shape of the maxillae and the mandible are pre-set long before birth and the tendency towards certain types of malocclusions is inherited. According to Sicher, growth mechanisms of the maxilla are different from that of the mandible. The maxilla growth is sutural, whereas the mandible grows more like a long bone and is primarily cartilagineous at the head of the condyloid process with certain differences due to the alveolar process and the teeth. Any divergence in the rate of growth of the maxilla and mandible will affect the relationship of the jaws and, therefore, the dental arches. Furthermore, the eruption of the teeth must be coordinated with the growing bones or improper timing will result in malposition of the teeth.

The size of the teeth is also predetermined or inherited and the lack of coordination of tooth size and jaw size is one of the most important causes of discrepancies in tooth-jaw relationships. This is especially important since the eruption of adult size permanent teeth into an immature mandible or maxilla makes for difficulty in assessing the future of the denture. One phase of mandibular growth, which has to do with the eruption of the molar teeth and the general lengthening of the mandible, should be mentioned as it is not generally understood. It is through the resorption of the anterior border of the ramus and apposition to the posterior border that the body of the mandible lengthens and serves to uncover the unerupted molar teeth and also to widen the mandible posteriorly. There is good evidence available that mandibular width in the canine area does not increase noticeably after the age of six and it has been my unhappy experience that it cannot be permanently increased in this area by therapy at this time. The alveolar process of the mandible and maxillae serves to increase the vertical height of the jaws and is generally an organ of continuous growth as long as teeth are contained within its plates. Loss of a tooth causes the alveolar process to disappear in that area. The basic hereditary pattern is set, and when the eruption of the teeth begins, the stage is set for the developing occlusion. The maxillae, mandible, dental arches, and the individual teeth are now subjected

to environmental forces which serve to position the teeth.

The environmental forces affecting the teeth are three; muscular, occlusal, and eruptive. The muscular forces are primarily the lips on the outside and the tongue on the inside. Obviously, any aberration of these forces will cause the teeth to assume a position out of harmony depending on the amount and position of the force. Generally, these are deviations of the function of these muscles caused by difficult breathing, tonsillar or adenoid obstruction, or alterations of function of the tongue. Occlusal forces are those caused by the direction of the teeth which are normally directed apically and dissipated throughout the peridontal structures. Mesial drift of the primary dentition prior to the eruption of the six year molar, is rare. The spacing in the anterior region when it occurs is usually preserved. However, with the eruption of the permanent molar teeth into the arches the problem of mesial drift begins and the loss of a tooth becomes an important factor in the preservation of the arch. Eruptive forces as demonstrated first by the lower first molar exert a strong mesial force against the second primary molar. The upper permanent first molar erupts in a distal direction swinging downwards into occlusion before exerting a mesial force. As the second and third molars following the same general pattern erupt, the mesial force becomes greater in proportion to the amount of room available.

Minimum requirements and responsibilities of those involved in the treatment of the child patient should, therefore, be for all practical purposes, first the maintenance of the dentition and restoration of the individual teeth. The retention of these members even though they may have to be subjected to pulpotomy and root canal fillings, makes the ideal means of preserving arch length. In the event that this is not possible, then the problem of space maintenance becomes increasingly important. Responsibility begins with the premature extraction of the primary tooth. Generally, the importance of holding a space in the primary dentition increases directly with the more distal primary tooth. In other words, the loss of a second primary molar space is more serious in the cause of a malocclusion than the loss of the first primary molar space and the loss of the primary cuspid, lateral, and central spaces is less important in that order. As we have stated, the six year molar will invariably drift forward into the space left by a prematurely lost second primary molar. The speed with which this occurs depends on the crowding of the teeth and the rapidity of growth of the jaws at this time. Although it has been observed that the development of the teeth and jaws is independent, there does exist a harmonious relationship between the two. According to Sarnat,[5] "Normal eruption of the posterior teeth is entirely dependent upon normal growth of the mandibular ramus which, in turn, is dependent upon activity of the condylar cartilage." This he has shown in an interesting experiment in which the condyles of young monkeys were removed and the resultant lack of growth inhibited the eruption of the posterior teeth. While there is not serious argument about the value of space maintenance in the primary dentition, it is amazing how reluctant many practitioners are to make space maintainers or in many instances, appliances are

made which are impossible for the child to wear. It is important, therefore, that the general practitioner knows how to make and maintain an adequate space maintainer. The literature is full of many designs of space maintainers and the construction of a good space maintainer is not a difficult technical procedure. It is possible that the reason many of these appliances fail and the disappointment many general practitioners have had with this phase of children's dentistry, is due to their approach to the procedure. Failure to realize the limitations of the appliances and that maintenance of the retainer is as important as that of the space must be understood. The average child wearing one of these appliances is rapidly approaching the height of his "eatin' career." He not only eats his three meals a day but is constantly placing other items of dietary delight, such as candy, chewing gum, popcorn, pencils, popsicle sticks, or other handy objects into his mouth, and if this is not enough, the nervous habit of grinding the teeth and playing with the appliance with his tongue has been observed. In other words, the appliance takes a "beating" and has to be watched, repaired, and often replaced. Those who fully appreciate the element of maintenance of the maintainer when estimating the fee for this procedure, will have less difficulty bringing themselves to care for these appliances for the long period of time many of them must be worn.

The problem of appliances for the control of habits should be considered in the light of the child's emotional as well as his physical development. Considerations of placing mechanical interference in a child's dental developing structures should be directed to include how much and to what end. Many deleterious habits have been handled by pedodontists with great success. For example, thumb-sucking continuing beyond the fifth or sixth year can be discouraged by an adequately designed appliance which while not interfering with the child's ability to place his thumb in the mouth, does inhibit or discourage the pleasure gained from this so-called habit. More important, the same appliance dissipates the force applied by the thumb and prevents further distortion of the anterior portion of the maxilla should the child persist in the habit. Should the appliance be successful and the habit broken there is good reason to expect that the normal action of the lips will retract the teeth to some semblance of normality. There is good evidence that the more drastic types of appliances and restraining devices used to prevent thumb-sucking may cause untoward difficulties in the child's behaviour pattern. Since it is beyond our province to treat the child and his parents psychiatrically, the placing of an appliance to prevent thumb-sucking should be approached with caution. Combinations of thumb-sucking with other infantile behaviour characteristics, such as enuresis, which extend beyond the acceptable age range should be a signal of possible serious emotional disturbance and the placing of an appliance may increase the child's anti-social behaviour. It might be wise to share the responsibility with the child's pediatrician or other individuals who could offer some help to the child, if at all possible.

There are many other habits which cause difficulties to the developing dentition, such as leaning, perverted tongue sucking and lip sucking habits, all of which are troublesome and some of which are exceedingly difficult and time-

consuming to overcome. Appliances alone are not always the answer, and the placing of the appliance for their correction must have some sound basis and assurance of success before they can be effective.

Conditions which can be definitely helped are cross-bites, especially early in their development. Anterior cross-bite can be corrected sometimes with tongue depressors, or acrylic splints over the lower teeth. These usually take only a short time to accomplish correction and are generally very effective. Posterior cross-bites may be more difficult and should be considered carefully before attempting correction.

Diastemata of the upper central incisors have been a fair target for correction by many pedodontists, often with great success. However, elements which should be considered are (1) will they be self-correcting, and (2) are they a part of a malocclusion and will their correction prove a detriment rather than a help? Correction before the eruption of the cuspids may not be necessary as in many instances self-correction occurs with the eruption of the adjacent teeth. It is possible that too early correction will eliminate space which would be necessary for the eruption of teeth to the posterior. The question of the frenum and whether or not it should be removed is a knotty one. Unless the frenum is unusually thick and high on the alveolar process extending through to the lingual, its removal is not indicated. As the dentition matures many heavy frenums recede and become smaller. Waiting until the permanent cuspids erupt may be a wise course. Centrals widely spaced and anterior to the line of occlusion are not particularly benefited by being brought together if their distal movement is not accomplished at the same time. The closing of diastemata while dramatic and highly successful at the time, should be approached with the thought of relating it to the rest of the denture.

Bite raising appliances, such as bite planes to overcome extreme over-bite, can be useful if properly designed, but can cause much damage and discomfort if not properly constructed. A bite plane to be effective requires much cooperation on the part of the patient. Since most of the time the jaw is or should be at rest, the effective time for application of a bite plane is during mastication and, therefore, the bite should not be opened more than a millimeter at a time to allow some mastication. It is effective because the alveolus is an organ of continuous growth and the posterior teeth and the alveolus will increase in vertical height when unobstructed and the teeth do not extrude out of the alveolus. Splints placed between the posterior teeth will allow the anterior teeth to erupt and cause much discomfort when the appliance is removed. In cases where the upper anterior teeth are forward or protrusive, no permanent gain is accomplished unless provision for retracting the upper anterior teeth is accomplished at the same time.

In any attempt by the pedodontist or general practitioner to correct or intercept a malocclusion, good records are of real importance for the operator to be able to evaluate the condition he is attempting to treat and to evaluate his results. A good set of plaster models and a set of roentgenograms will, when studied, not only prevent the operator from making mistakes but when followed by a set of records at completion of the

procedure, will afford him great satisfaction when successful, and be invaluable in learning where he erred when falling short of the desired effect.

Increasing interest in serial extraction has, according to Dewel,[7] caused more than a little apprehension on the part of its advocates. This most useful procedure must be approached with caution lest more harm than good be done. "The term Serial Extraction implies the removal of selected teeth in an orderly manner over a prolonged period of time." There are three stages to this procedure, (1) usually premature extraction of the primary canines to allow the space for the permanent central and lateral incisors when they appear crowded out of the arch, (2) subsequent extraction of the first primary molars permits the desirable early eruption of the first bicuspids, and (3) the final extraction of the first bicuspids to make possible the eruption of the permanent cuspids. There are many exceptions to this order and each case must be considered individually. This procedure is usually used when in the opinion of the orthodontist the permanent bicuspids will have to be removed eventually. Thoughtless extraction of primary teeth may needlessly doom a case to the extraction of permanent teeth. The responsibility for this procedure should rest with the person who will ultimately finish the orthodontic care of the patient.

One of the most difficult problems facing all of us, general practitioners, pedodontists, and orthodontists, is when to refer cases to the orthodontist for treatment and for the orthodontist—when to treat. That many of us are confused, is not at all surprising. There are many schools of thought and the pendulum swings from one extreme to the other with clock-like regularity. We have discussed conditions which should be corrected early, such as cross-bite. In addition, mandibular protrusions can be corrected in the primary dentition. On this score, there is not much disagreement. The problem is in maxillary protrusion cases and those neutrocclusion cases with crowding of the teeth. These form the great majority of orthodontic cases especially those in which the possible extraction of permanent teeth may be a consideration in the eventual correction of the malocclusion. To attempt tooth guidance procedures beyond anterior or posterior cross-bites in these cases should cause some thought on the part of the operator and consultation with the orthodontist may reveal problems which are not immediately apparent. The orthodontist may decide to treat the case in the mixed dentition which would solve the problem of the pedodontist's involvement in the case then and there. Other considerations which may affect the decision as to when to treat cases, are the age of the patient and the severity of the case. It must be kept in mind that the age when most malocclusions become apparent is during the mixed dentition and, depending upon the child's rate of eruption, this period may extend over a period of five to seven years. Treatment during this period cannot be called complete until all of the primary teeth have been replaced by their permanent successors, usually at the age of twelve. Even beyond that period changes continue until growth has stopped or slowed down. Treatment started early in the child's life may, therefore, continue over a period of many years. The whole or the total child should be considered in our desire to accomplish our objective in the child's

mouth. A wise person once said that there are about 18 to 24 months of cooperation in the average child, after which he becomes worn out, discouraged, or disinterested. This is a period in his life when a lot is happening to him. There are many complex emotional factors which are affecting him as well as the bewildering growth changes which are occurring. Our society is "throwing a lot at the child" in competitive living. Besides going to school, he is brought to the dentist, pediatrician, music and dancing lessons, after-school activities, scouting, clubs, athletics, to which is added the stimulation of radio, television, and movies. Before adding to his burdens, let us be as sure as we can reasonably be that we do not complicate his life and ours for any greater length of time than is absolutely necessary.

Finally, in considering the question of how far should one go in the "never-never land between orthodontics and pedodontics," the answer must lie within your own concept of how much responsibility you wish to accept for the dental development of the child, based on your knowledge and background.

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Notice

Five candidates successfully passed the 1958 examination of the American Board of Pedodontics, which was held in Indianapolis, Indiana July 29th through the 31st. They are:

Robert G. Andrews, D.D.S.
1879 Newport Blvd.,
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The 1959 Board examination will be held December 14-17, 1959 at Northwestern School of Dentistry, Chicago, Illinois.

Ralph L. Ireland, Secretary

Report of a Case With Supernumerary Teeth and Treatment

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SAMUEL PRUZANSKY, D.D.S., M.S.**

SUPERNUMERARY teeth in the anterior upper dental arch have been estimated to occur in about 0.3 per cent of the population.[1] The most frequently reported anomaly is the mesiodens which is often found bilaterally in the upper midline and peg-shaped in morphology.[2-5] If found early through a routine roentgenographic survey, the removal of these supernumeraries will allow a normal occlusion to develop.[6] The failure of these teeth to erupt may cause malposition of the incisors and can lead to dentigerous cyst formation.[7] Eruption of supernumeraries will usually result in a severe local malocclusion predisposing the area to periodontal breakdown.[1]

This patient, an eleven year old Negro boy, presented with two erupted supernumerary incisors in the upper midline. All permanent teeth except the third molars were fully erupted and extreme crowding was present in the maxillary anterior segment; his mandibular dentition was normal. The supernumerary teeth were identical in morphology to the other incisors and intermediate in size between the centrals and laterals. Although most mesiodens are not of the usual upper incisor morphology, a very similar case was recently reported.[8] Analysis of posterior inter-arch relation showed the upper teeth on the left side to be forward the full width of a premolar with respect to the lower teeth. Buccal occlusion was otherwise within normal limits.

The treatment objective was to establish normal incisal function and overjet with an esthetically pleasing dentition. Because posterior tooth alignment and function were acceptable, therapy was limited to alignment of the upper anterior teeth in the space available. To determine which of the six incisors would best fit into this space, the maxillary anterior teeth were separated from a plaster model of the upper dentition and repositioned with wax in the desired alignment. After the cuspids were set to position, the right lateral, right supernumerary and left central incisors filled the remaining space exactly.

The other three incisors were extracted; orthodontic bands were placed on the remaining incisors and the upper first bicuspids. When these teeth were aligned, the cuspids erupted normally into the arch space made available for them. After band removal, an upper Hawley retainer was worn for three months. The resulting occlusion fulfills the requirements of function, stability and esthetics indicating that the unusual treatment plan was correct for this case.

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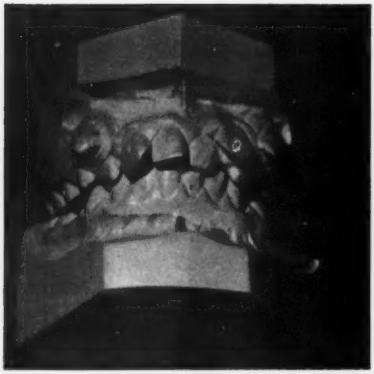
Figure 1. The extracted upper incisors.

(a)

(b)

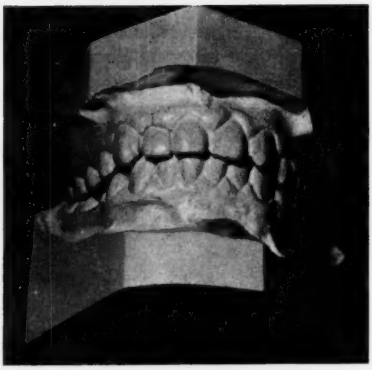
(c)

Figure 2. (a) Initial malocclusion. (b) After extractions, treatment in progress. (c) Final occlusion, post retention.



(a)

(b)



(c)

FIGURE 3. (a) Original models. (b) Models with indicators of the teeth to be extracted. (c) Final Models.

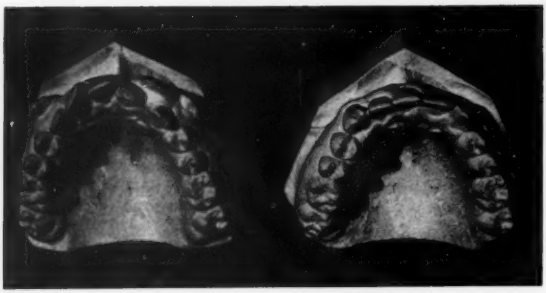


FIGURE 4. Comparison of upper models before and after treatment.

The Endodontic Management of the Young Permanent Tooth

SAMUEL S. PATTERSON, D.D.S.*

ONE of the most difficult problems confronting the general practitioner is the management of the young permanent tooth that has had some injury to the pulp which requires endodontic therapy.

The size of the apical opening has a direct bearing on the ease of operative procedures and technique to be followed in obturating the root canal space. In cases of incomplete growth, internal resorption, or some fractures of the root, it is often impossible to hermetically seal the apex with manipulation through the crown entree of the tooth. Since the above-mentioned conditions often require approach at the apex as well as approach through the pulp chamber, the operator must resort to apical periodontal surgery in the form of an apicoectomy or apical curettage to completely seal the large apical foramen.

Since the stage of root development and the size of the main apical foramen have a direct bearing on the management of the endodontic therapy, it is first necessary to describe the root condition. For ease of explanation, roots of young adult teeth have been classified according to the degree of development. The following is a correlation between root development and the size of the main apical foramen. Green[1] has shown that human teeth have numerous apical foramina. There is always one larger main opening in or near the root apex.

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CLASSIFICATION OF ROOT DEVELOPMENT OF PERMANENT TEETH

Class 1. The open funnel-shaped root canal wherein the root development is more than one half of its adult size, but less than complete length. The lumen of the canal is extremely large and the diameter of the apical foramen is larger than the canal lumen. Fig. 1a.

Class 2. The open apex wherein root development has grown to almost complete length. The lumen of the canal is smaller than that of Class 1 but still has a greater diameter than the root canal proper. Fig. 1b.

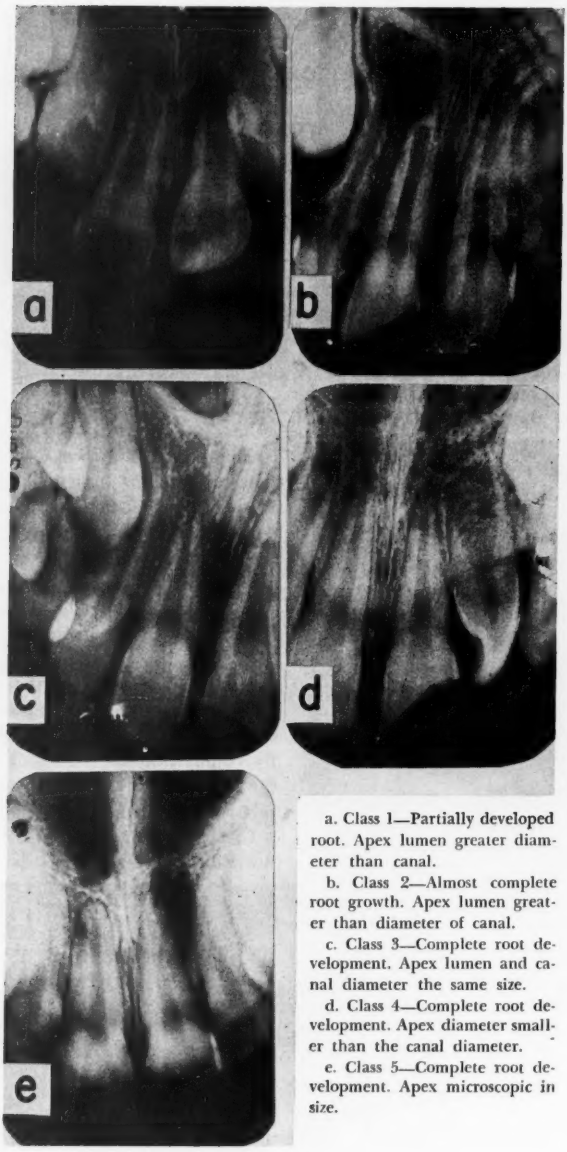
Class 3. The root development is almost complete and the lumen of the canal and the apex are the same size. Fig. 1c.

Class 4. The root length is complete and the diameter of the apical foramen is smaller than the diameter of the canal. By comparison to the old adult tooth, the diameter of the apical foramen is relatively large. Fig. 1d.

Class 5. The tooth has completed its normal development and the root canal tapers to an extremely small apical foramen. Fig. 1e.

Class 1 Fig. 1a and Class 2 Fig. 1b usually present the greatest problem in endodontic therapy and more often require surgical intervention. Classes 3, 4, and 5 can generally be managed in a routine manner and seldom require surgical management.

The patient that presents for endodontic therapy to an injured undevel-



a. Class 1—Partially developed root. Apex lumen greater diameter than canal.

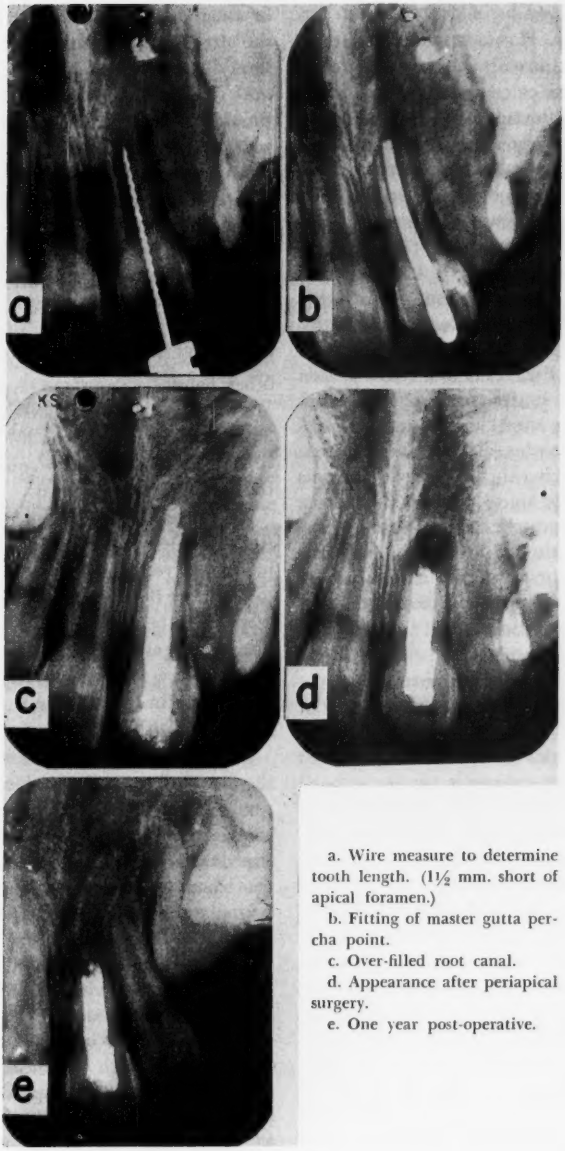
b. Class 2—Almost complete root growth. Apex lumen greater than diameter of canal.

c. Class 3—Complete root development. Apex lumen and canal diameter the same size.

d. Class 4—Complete root development. Apex diameter smaller than the canal diameter.

e. Class 5—Complete root development. Apex microscopic in size.

FIGURE 1



a. Wire measure to determine tooth length. (1½ mm. short of apical foramen.)

b. Fitting of master gutta percha point.

c. Over-filled root canal.

d. Appearance after periapical surgery.

e. One year post-operative.

FIGURE 2

oped tooth can be of any age from 5½ years on up. However, the injury that has occurred usually has taken place before complete calcification of the root or generally, before the age of ten. Occasionally the large apical opening is due to internal or external resorption or a fracture of the root. In these instances the large apical aperture occurs after complete root development.

Generally the patient has been involved in some accident which has brought about the death of the pulp tissue. The crown of the tooth might be intact as in Fig. 1e, or the crown of the tooth might be fractured as in Fig. 1d. The fracture might expose a portion of the pulp chamber or miss the pulp cavity completely. If the patient presents with an acute apical periodontal abscess, then steps must be taken to relieve the patient of pain and infection. To accomplish this relief, drainage must be established and adequate antibiotic and anodyne therapy administered.[2]

This paper will deal primarily with the technique involved in treating the young adult tooth which is in a state of comfort and free from acute infection. The principles of sterile surgery and lack of tissue trauma must be adhered to in order to obtain the desired results. Therefore, it is imperative to perform all necessary endodontic procedures with a rubber dam isolating the affected tooth. This technique sometimes presents a problem in that the affected tooth has not erupted far enough into the oral cavity to comfortably hold a rubber dam in place or the crown has been fractured to the degree that a rubber dam clamp will not hold. In such cases it might be necessary to band the tooth first.[3] An ordinary copper band should be contoured and trimmed to fit snugly to the neck of the tooth at the free cervical margin. The band should be trimmed short enough so as not to interfere with occlusion and should remain on the tooth throughout the entire course of treatment.

An adequate assortment of rubber dam clamps will greatly facilitate the placement of the rubber dam in these cases where the teeth are only fully or partially erupted. The butterly clamps, Ivory No. 6, S.S. White No. 211, and the Ivory root clamp No. 1a are the three clamps of choice for anterior teeth. The other helpful clamps for posterior teeth are S.S. White No. 200, S.S. White No. 201, and S.S. White No. 207. Generally it is necessary to isolate only the one tooth that is to be treated.

All instruments and materials must be sterile. Since most root canal instruments are very fragile, they are subject to breaking if forced, and a rusty instrument will be more prone to fracture. For this reason dry heat sterilization is best. Dry heat sterilization requires baking the instruments in a closed oven for 30 minutes at 350° F.[4]

After the rubber dam has been placed, the dam and tooth should be swabbed or sprayed with an antiseptic. Clear merthiolate is excellent for this purpose. If the crown is intact then entree to the root chamber should be made from the lingual surface slightly above the cingulum where the proximal marginal ridges fuse to form the lingula. The opening should be made with a sterile carbide bur or diamond tip. If the crown is fractured it might be advisable to make the entree through the incisal aspect of the crown portion. Regardless of the point of entry, the opening should be in direct line with the pulp chamber

and root canal for proper biomechanical preparation.[5]

Treatment Procedure (Necrotic Pulp)

FIRST VISIT. After an accurate diagnosis of the affected tooth has been made, an opening is cut through the crown of the tooth. The roof of the pulp chamber is removed, and the pulpal debris is removed from the pulp chamber. The pulp chamber is lightly irrigated with some type of chlorinated antiseptic solution such as *4 per cent chloramine T or a 4 per cent solution of sodium hypochlorite.* The pulp chamber is then thoroughly dried with sterile absorbent cotton pellets and a treatment of *cresol* is placed in the pulp chamber. This treatment is sealed with a double seal of base plate gutta percha, zinc oxide and eugenol using zinc acetate to facilitate quick setting of the zinc oxide eugenol cement. Thus, the first visit is completed and the patient should be instructed to return in about 48 to 72 hours according to the operator's appointment schedule.

SECOND VISIT. On the patient's return the rubber dam is again placed, with sterile burs the double seal and treatment are removed. The pulp chamber and canal are thoroughly irrigated with the antiseptic irrigating solution mentioned above and a coarse broach is introduced into the root canal and used in a sweeping motion to remove the gross particles of necrotic or injured pulpal tissue. This is again followed by lavage, and a measured file, Fig. 2a, is introduced into the pulp canal to ascertain the length of the tooth.

A radiograph is then made and if necessary, adjustments are made to the test file. Fig. 2a indicated that the file should be lengthened 1½ mm. Again the canal is thoroughly irrigated with chlorinated antiseptic solution and a large file is used to curette the side walls of the root canal. Files range from 1-12 in size. The larger the number, the wider the diameter of the file. After the canal has been thoroughly curetted and irrigated, it is dried with absorbent points and a treatment of *Beechwood creosote* is placed in the canal on a large blunted absorbent point. The point is merely dampened with B. creosote and this is inserted about two thirds of the length of the canal. Each treatment is accomplished with a different germicide, since a rotation of medication is desirable. Sterile cotton pledgets are placed over the medicated point and the canal orifice is filled with a double seal as described above. The patient is then dismissed for a period of three to seven days.

THIRD VISIT. The rubber dam is again placed, the field sterilized, and the previous treatment removed. The next step is that of obtaining a culture specimen from the tooth. The operator should be familiar with this technique.[6] After obtaining the culture the operator then attempts to fit the master gutta percha point in the canal. Due to the fact that the apical opening is wider than the lumen of the canal, it will be impossible to find any one point that will adequately obturate the canal, but the largest point is selected that appears radiographically to fill most of the lumen of the canal at the apex.

Sometimes it is necessary to custom-make a gutta percha master point by rolling a piece of temporary stopping between two warm glass cement mixing slabs. After the point has been rolled,

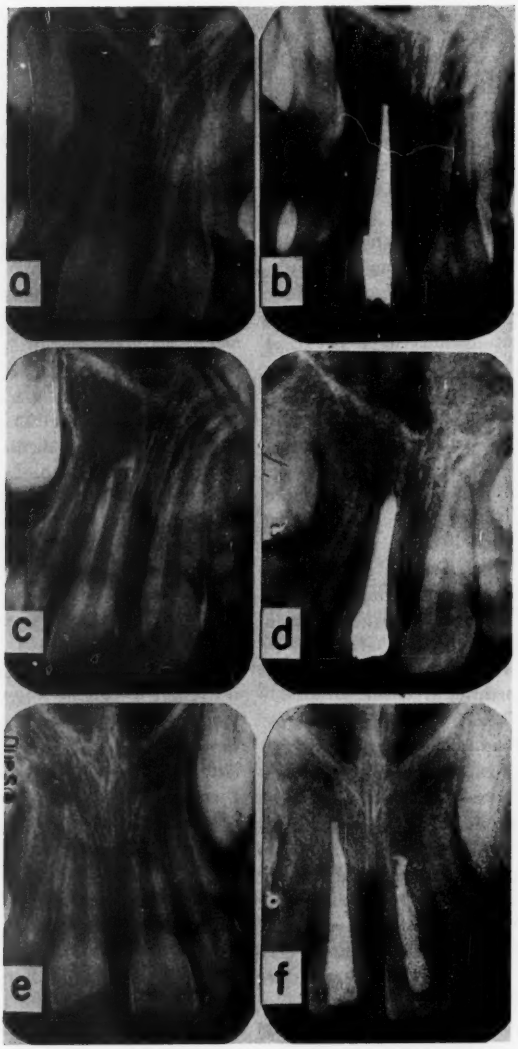


FIGURE 3

a. 12-7-55
b. 6-19-56
c. 6-18-56
d. 9-14-57
e. 2-24-57
f. 9-14-57

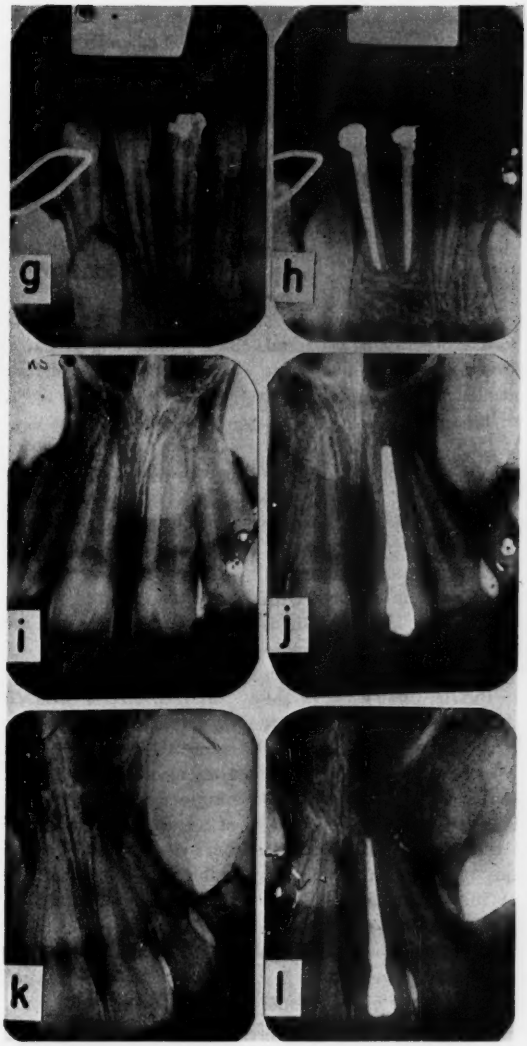


FIGURE 4

g. 3-29-56
h. 4-5-57
i. 2-15-56
j. 7-20-57
k. 7-10-56
l. 4-16-57

it is made stiff and sterile by being immersed in alcohol, and this process is continued until the desired diameter is obtained. The point is placed in the root canal and a radiograph is made to verify the length and fit of the master gutta percha point. This point is then stored in an antiseptic solution, and a treatment of *camphorated paramonochlorophenol* is placed in the canal similar to the treatment described at the second visit. The canal is sealed as before and the patient is dismissed. It is necessary to wait at least three days and preferably a week to obtain the result of the specimen which has been placed in the culture media.

FOURTH VISIT. If the culture specimen has been found negative, or no growth has occurred, the fourth and final treatment is instituted. Again the rubber dam is placed and the old treatment is removed; the canal is dried with absorbent points, and is flushed with 100 per cent alcohol. The alcohol is used as a desiccant to remove the moisture in order that the root canal sealer will adhere to the dentinal walls of the canal. The master point is then liberally coated with Rickert's formula root canal sealer (Kerr's antiseptic pulp canal sealer) and is inserted to the full depth of the canal. With the aid of a Kerr No. 3 root canal spreader, auxiliary points are forced into the root canal so that the lumen of the canal is thoroughly obturated with a homogenous gutta percha sealer filling. It is necessary to actually over-fill the root canal at this point and the root canal filling should be dense and solid without crevices and spaces between the master point and the auxiliary points. The excess root canal filling material is removed from the entrance of the canal and a temporary filling material placed over the canal entrance. The rubber dam is now removed and a radiograph made of the over-filled canal. Fig. 2c. The patient is now given a sedative[2] and local anesthesia is administered. Infiltration anesthesia in the upper arch along with the infraorbital and the nasopalatine injections[7] are necessary to produce profound anesthesia in anterior teeth. The mandibular block will sufficiently anesthetize the lower teeth.

An adequate assortment of instruments used to perform apical periodontal surgery should include:

A sharp scalpel
Periosteal elevator
Austin tissue retractor
Small and medium curettes
Small and medium bone files
558-559-560 straight handpiece burs
Hemostat
Needle holder
Tissue scissors
Suture needles and black silk suture No. 000
Sponges and swabs.

SURGICAL TECHNIQUE. An elliptical incision is made short of the mucobuccal fold, and tissue overlying the apex of the tooth is retracted. Access is obtained to a point adjacent to the end of the root and the apex is exposed with burs or curettes. The excess root canal sealer is removed, and the apex of the tooth is seared with a hot plastic instrument. After this procedure, the tissue around the root apex is thoroughly curetted, the wound is irrigated, and the flap is sutured into place. Fig. 2d shows the appearance of the tooth following the apical periodontal surgery. Fig. 2e is the appearance of this tooth about a year later. Figures 3 and 4 are the preoperative and postoperative re-

sults of young anterior teeth treated in the manner described above.

Conclusion

It has been shown that it is possible to save injured young permanent teeth that have incomplete development of the root. The endodontic technique employed depends on the degree of root development. If sound judgment is used and sterile technique employed, healing should be uneventful. Healing is generally very rapid in the young individual. Extraction of the injured tooth places the patient in the class of a dental cripple for the duration of the dentition.

Summary

1. A classification is presented for root development. The classification is based on the degree of root growth and a relationship between the diameter of the root canal and the root apical foramen.

2. A description has been made of the "modus operandi" necessary to successfully treat such conditions.

3. Preoperative and postoperative radiographs have been included to verify the success of this technique.

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Abstracts

THE SEX DIFFERENCES IN TOOTH CALCIFICATION. S. M. Garn, A. B. Lewis, K. Koski and D. L. Polacheck. J. D. Res., 37:561-567, June 1958.

This serial x-ray study of 255 children was carried out for the purpose of demonstrating sex differences in those stages of tooth development not easily accessible to visual examination. Oblique-jaw series supplemented by lateral skull plates were the source of the data for evaluation of stages of tooth development for full follicle formation, crown completion, alveolar eruption, attainment of occlusal level and apical closure. Statistical analysis pointed out that girls tend to be advanced over boys by an average of nearly four months and by amounts over ten months in all stages of development of mandibular molar and premolar teeth. The differences were greater for later stages of tooth development than for earlier stages. The sex differences for tooth calcification and eruption were not as great as the sex differences in skeletal maturation.

GORDON ROVELSTAD

AN ANALYSIS OF STRESSES IN A DENTAL AMALGAM RESTORATION. D. L. Mahler. J. D. Res., 37:516-526, June 1958.

This study was undertaken to evaluate the design of proximo-occlusal amalgam restorations for primary molar teeth with particular attention to the resistance form of the cavity preparation. Photoelasticity was the method of stress analysis selected utilizing photoelastic sensitive models eight times larger than actual tooth sizes. Models of restorations and models of primary teeth were studied thus giving stress patterns for both the restoration as well as the tooth. Locations of maximum tensile stress and the effect design variations had on this stress were then recorded. It was demonstrated that tensile stresses are low at the pulpal wall and increase markedly reaching a maximum at the occlusal surface. Any surface discontinuities at the occlusal surface such as carved developmental grooves, roughened surface texture or scratches produced deleterious stress concentrations. The tensile stress could be decreased in magnitude by placing the isthmus as close to the axial wall as possible. This reflected itself in a restoration with a sloping axial wall and a flat pulpal wall as having the least tensile stress. In addition it was demonstrated that increasing the width of the isthmus as well as the depth of the cavity preparation lowered the resistance of the tooth to structural deformation.

GORDON ROVELSTAD

ERUPTIVE MECHANISM AND MOVEMENT IN THE FIRST MOLAR OF THE RAT. C. O'Brien, S. N. Bhaskar and A. G. Brodie. J. D. Res., 37:467-484, June 1958.

The purpose of this study was to determine the cause as well as the direction of movement of the mandibular first molar in the rat. Fifty-four rats ranging in age from 13 days insemination to 30 days after birth, 20 of which were animals characterized by a retardation or absence of bone resorption in the presence of normal bone apposition

were used for the study. Camera lucida tracings of serial histological sections were superimposed to obtain the data comparing successive stages of the normal animals, successive stages of the normal animals to the abnormal non-resorptive animals and successive stages of the non-resorptive animals. Movement of the tooth germ in the cap or bell stage of development has been demonstrated by these studies thus confirming previous reports. In addition bodily movement of the tooth germ at an early age has been demonstrated. These data together with other findings of this study indicating that the cervical loop region of the tooth germ grows deeper into the jaws, that the tilted position of the crown of the first molar is corrected during eruption, and that histological changes occur in the follicle has led to the conclusion that tooth eruption is not a result of root elongation, bone apposition, dentin or enamel formation but probably a result of growth of the follicle. This growth is analogous to growth in a bony suture and it is suggested that the growth of the tooth root and apposition at the bottom of the crypt are the results of tooth migration rather than the cause.

GORDON ROVELSTAD

LIFE SHORTENING BY WHOLE AND PARTIAL-BODY X-IRRADIATION IN MICE. Robert F. Kallman, M.D., and Henry I. Kohn, M.D. Science Magazine, Vol. 128, P. 301, August 8, 1958.

With the tremendous importance that radiation and its hazards have acquired in our present scope of living, this article bears out certain salient points of importance to our profession.

The authors relate that ionizing radiations, in whole-body doses which cause little or no immediate morbidity have been demonstrated to shorten the life span in animals. The question is whether partial body exposure in man would have a life shortening effect in strict proportion to exposure dose or integral dose.

All mice received only a single x-ray dose, with the exception of the 1200-r whole-body treatment given as four 300-r fractions two weeks apart. All groups were irradiated under moderate Nembutal anesthesia.

The animals were allowed to die spontaneously but 22 per cent were sacrificed when they were moribund. One death occurred in the 1200-r whole body group at 85 days after the final 300-r fractions. Otherwise there were no deaths before 169 days post-radiation.

The authors found that 300-r and 560-r both shortened life significantly and to the same extent. The female mice were more sensitive. Per unit of tissue dose, partial-body exposure to pelvis or chest was much less effective than whole body exposure. In whole-body experiments the smallest dose was more effective per unit dose than larger ones. The smaller partial-body exposures were less effective per unit dose than larger ones.

The data furnished by the authors indicate how varied the life-shortening effects of partial- and whole-body exposure can be and the difficulties in attempting to extrapolate from one to another. They also indicate how inconclusive the quantitative estimates of life shortening in man must be when they are based on relatively incomplete data currently available for experimental animals.

MANUEL M. ALBUM

BOOK REVIEW

ORTHODONTICS, PRACTICE AND TECHNICS. Dr. J. A. Salzman, 497 pages with 471 illustrations and 34 tables. Index. Philadelphia-Montreal, J. B. Lippincott Co., 1957.

The second volume of this edition, Practice and Techniques, deals primarily with the appliances and technics of orthodontic correction. The various appliances are shown with clear and well labelled illustrations.

The details of many of the cephalometric analyses are discussed. Differential diagnosis and treatment planning are presented with the technic of appliancing. The appliances presented include the Edgewise Arch Appliance, the Johnson Twin-Wire Appliance, activators, myofunctional appliances, and bite plates.

The subject matter is well organized and the large number of illustrations increases the volume's usefulness.

DONALD B. SHUMAKER